

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

BANCO SAFRA S.A. – CAYMAN ISLANDS
BRANCH, Individually and On Behalf of All Others
Similarly Situated,

Plaintiff,

-v-

SAMARCO MINERAÇÃO S.A., BHP BILLITON
LIMITED, BHP BILLITON PLC, BHP BILLITON
BRASIL LTDA., VALE S.A., RICARDO VESCOVI
DE ARAGÃO, KLEBER LUIZ DE MENDONCA
TERRA, MAURY SOUZA JUNIOR, JOSÉ CARLOS
MARTINS, STEPHEN MICHAEL POTTER, JAMES
JOHN WILSON, JEFFERY MARK ZWEIG, HELIO
CABRAL MOREIRA, SÉRGIO CONSOLI
FERNANDES, PEDRO JOSÉ RODRIGUES, and
MARGARET BECK,

Defendants.

Civil Action No. 1:16-cv-8800-RMB

CLASS ACTION

AMENDED COMPLAINT FOR
VIOLATIONS OF THE FEDERAL
SECURITIES LAWS

DEMAND FOR JURY TRIAL

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Lead Plaintiff Banco Safra S.A.—Cayman Islands Branch (“Lead Plaintiff” or “Plaintiff”), on behalf of itself and all others similarly situated, alleges the following based upon personal knowledge as to itself and its own acts, and upon information and belief as to all other matters based on the investigation conducted by its attorneys, which included, among other things, the review and analysis of: (i) public statements and representations made by Samarco Mineração S.A. (“Samarco”), offering memoranda, sustainability reports, management reports and financial statements issued by Samarco; (ii) Securities and Exchange Commission (“SEC”) filings and other public statements and representations made by BHP Billiton Limited (“BHP Ltd.”) and BHP Billiton Plc (“BHP Plc”) (collectively, “BHP Billiton”), and BHP Billiton Brasil Ltda. (“BHP Brasil”) (altogether, “BHP”); (iii) SEC filings and other public statements and representations made by Vale S.A. (“Vale”); (iv) records from federal and state public prosecutors, government agencies, and federal and state courts in Brazil; (v) sworn testimony provided to Brazilian prosecutors by former employees of Samarco, consultants, and other witnesses with relevant knowledge; (vi) pleadings and evidence gathered in civil and criminal proceedings in Brazil against Samarco and its joint owners, BHP Brasil and Vale; (vii) minutes of meetings of Samarco’s board of directors (the “Samarco Board”); (viii) minutes of meetings of Samarco’s internal and external committees (*e.g.*, Dam Committee, Operations Committee, and Independent Tailing Review Board); (ix) the allegations contained in pleadings filed in *In re Vale S.A. Securities Litigation*, No. 1:15-cv-09539-GHW (S.D.N.Y.) (the “Vale Litigation”) and in *In re BHP Billiton Limited Securities Litigation*, No. 1:16-cv-01445-NRB (S.D.N.Y.) (the “BHP Litigation”), as well as certain sources incorporated therein; (x) press releases, investor presentations, corporate videos, and other information issued or disseminated by Defendants

(defined below); (xi) news articles and media coverage of the events giving rise to this action; and (xii) research and reports by securities and financial analysts.

The investigation of Plaintiff's attorneys is continuing, yet certain additional facts supporting these allegations are known only to Defendants or are exclusively within their custody or control. Plaintiff believes that substantial evidentiary support will exist for the allegations set forth herein after a reasonable opportunity for discovery.

I. NATURE OF THE ACTION

1. This is a securities class action on behalf of all purchasers of debt securities issued by Samarco between October 31, 2012 and November 30, 2015, inclusive (the "Class Period"). The action seeks to pursue remedies against the Defendants (as further defined below) under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 (the "Exchange Act") and Rule 10b-5 promulgated thereunder (17 C.F.R. §240.10b-5), on behalf of all purchasers of debt securities issued by Samarco during the Class Period, who purchased such securities in domestic (U.S.) transactions.

2. This class action also involves state law claims for common law fraud, negligent misrepresentation, and aiding and abetting fraud, brought on behalf of all purchasers of debt securities issued by Samarco during the Class Period.

3. This class action arises out of what is widely regarded as the worst environmental disaster in Brazil's history. On November 5, 2015, Samarco's Fundão tailings dam burst, releasing more than 16,000 olympic swimming pools' worth of wastewater (known as tailings) generated by Samarco's mining operations in the Brazilian state of Minas Gerais. When the dust had settled, the tailings had engulfed the downstream town of Bento Rodrigues, killed 19 people and injured many others, caused catastrophic property damage, and contaminated the Rio Doce River and the water supply for 200 towns. Toxic sludge ultimately traveled across two Brazilian

states via the Rio Doce before reaching the Atlantic Ocean, wreaking further harm along the way.

4. In the wake of the disaster, Samarco was forced to suspend its mining operations and BHP, Vale and Samarco were subjected to governmental investigations and judicial proceedings in Brazil with potential civil exposure of more than \$5 billion, criminal exposure, and untold reputational harm. Those proceedings are ongoing. Additionally, Vale and BHP were named as defendants in the Vale and BHP Litigations, two separate securities fraud lawsuits pending in the United States District Court for the Southern District of New York arising out of the companies' disclosures to investors regarding, among other things, the safety of their mining operations. In response to the catastrophe resulting from the failure of the Fundão dam, Brazil is contemplating legislation to outlaw upstream tailings dams such as the Fundão dam, which are less costly to construct but far more dangerous.

5. As a result of the Brazilian investigations and proceedings, as well as investigations by members of the global news media, information has come to light that confirms Defendants' knowledge and awareness of material facts, previously undisclosed to the public, that significantly undermine the truth, accuracy and completeness of statements that Defendants made to investors and otherwise publicly. As detailed herein, these statements were made throughout the Class Period about the safety of the Samarco's mining operations, including the Fundão dam and the tailings deposited at the dam, Samarco's iron ore production and related matters, without regard for their veracity and in contravention of the obligation to make full, and truthful, disclosure. In fact, as alleged below, Defendants continued making misleading statements even after the Fundão dam burst, when they denied that the tailings were toxic in nature.

6. Shortly before the Class Period, BHP Brasil and Vale—equal co-owners of Samarco—oversaw the implementation and completion of a \$3.2 billion project, which they financed, that increased the iron ore production capacity of Samarco by approximately 37% (the “P4P Project”). The Fundão dam was chosen to accommodate the growth in tailings resulting from increased iron ore mining and production associated with the P4P Project. As a result, the Samarco Board approved a project to elevate the Fundão dam by 20 meters in April 2015, to be followed by another 20 meters in August 2015. The P4P Project expanded Samarco’s iron ore pellet production capacity from 22.3 million tons per annum (“Mtpa”) to 30.5 Mtpa.

7. However, Defendants systematically ignored warning signs regarding the precarious condition of the Fundão dam. These red flags ranged from visible cracks in the dam’s structure to persistent emergency signals from instruments, known as piezometers, designed to monitor and measure groundwater pressure. In fact, these issues were so serious that the Samarco Board—which included several BHP and Vale representatives—frequently discussed remediating them at meetings before and during the Class Period.

8. Additionally, concerns regarding some of these problems were raised in October 2013 in a report prepared by the Instituto Pristino (the “Pristino Report”), a Brazilian not-for-profit environmental and geotechnical modelling institute. The Pristino Report warned Defendants of design deficiencies associated with the Fundão dam and its planned expansion to accommodate the mine’s increased production capacity, and recommended extensive monitoring of the dam and Samarco’s submission of an emergency contingency plan given the proximity of the dam to the nearby village of Bento Rodrigues.

9. Similarly, Pimenta de Ávila, the designer of the Fundão dam, alerted Samarco in September 2014 about the possibility of liquefaction and recommended the installation of new

piezometers to monitor the saturation level at the dam. A report prepared by VOGBR only after the dam burst concluded that “the susceptibility of the sandy tailings to liquefaction is evident.”

10. Compounding these problems was the fact that, unbeknownst to investors and the Brazilian authorities, Vale regularly used the Fundão dam to dispose of tailings from other mining operations nearby, pursuant to a contract with Samarco. Indeed, Brazilian prosecutors reportedly obtained documentation confirming that tailings from Vale’s own operations accounted for *up to 27%* of overall tailings stored by the Fundão dam.

11. Also evidencing Defendants’ disregard for the precarious condition of the Fundão dam was Samarco’s refusal to implement an emergency plan to monitor safety at the dam in 2009. Randal Fonseca (“Fonseca”), the owner of Rescue Training International Consulting (“RTI Consulting”), explained that the devastation caused by the dam break could have been avoided if Samarco had spent \$1.5 million to institute the plan. In 2009, Samarco hired RTI Consulting to develop an emergency action plan (“EAP”) for its mining units, including the Germano complex and the Fundão dam. According to Fonseca, however, the Samarco Board refused to approve the plan because it was too costly and more complex than what was required under Brazilian law.

12. Despite these adverse facts, which Defendants knew or recklessly disregarded, Defendants repeatedly emphasized, among other things, their focus on the health and safety of Samarco’s employees and the communities in which Samarco operates; safety, risk management and monitoring protocols and controls; and compliance with local laws and regulations. Furthermore, Defendants favorably described the tailings operations, the P4P Project and the expansion of Samarco’s mining operations, tying the expansion to increased production metrics for Samarco.

13. In truth, the problems plaguing Samarco's operations flatly contradicted the positive statements Defendants made throughout the Class Period, before the Fundão dam disaster occurred on November 5, 2015. In the immediate wake of the catastrophe, investors learned that Samarco had failed to implement a viable EAP and that the Fundão dam had longstanding and systemic structural defects. They also learned that Defendants had ignored repeated warnings regarding these issues, as evidenced, for example, by the Pristino Report and individuals and entities with knowledge of the Germano mining operations, including Pimenta de Avila and Fonseca. And given the extent of the problems, they learned that the Samarco iron ore production estimates were false and misleading, and without a reasonable basis, when made.

14. These revelations exposed the falsity of certain of Defendants' earlier Class Period statements, causing the trading price of Samarco's bonds to decline in concert with exposure of the news, between November 4, 2015 and November 30, 2015, inclusive. Nevertheless, Defendants continued to perpetuate falsehoods regarding the severity of the disaster, the damage on the surrounding communities, and Defendants' fallout:

Bond	Prior Date for which Price Reported	Price	Date for which Price Reported	Price	% Change
2014 229 Bonds	11/4/2015	86.35	11/30/2015	37.25	-56.9%
2014 AD3 Bonds	10/26/2015	86.50	11/30/2015	37.00	-57.2%
2013 515 Bonds	11/4/2015	90.47	11/30/2015	36.00	-60.2%
2013 AC5 Bonds	11/3/2015	90.25	11/30/2015	34.75	-61.5%
2012 174 Bonds	11/4/2015	85.10	11/30/2015	37.00	-56.5%
2012 AA9 Bonds	11/3/2015	83.13	11/30/2015	36.00	-56.7%

15. Immediately after the Fundão dam's collapse, on November 6, 2015, Samarco announced that "The waste is inert. It consists mostly of silica (sand) from the iron ore processing and presents no chemical that is harmful to health." This representation was false and

misleading, and otherwise without a reasonable basis when made. Indeed, on November 25, 2015, the United Nations reported that multiple independent scientific tests, commissioned by Brazilian authorities after the collapse, found dangerous levels of toxic heavy metals in the Rio Doce River—a finding that Brazil’s Environmental Ministry confirmed after the Class Period, when it fined Samarco \$41.6 million for damage to protected areas contaminated by toxic heavy metals from the mudflow.

16. Then, on November 30, 2015, BHP disclosed that the Brazilian government intended to commence legal proceedings against Samarco, BHP Brasil and Vale to recover clean-up costs and damages. Brazil sought to force these entities to establish a fund of approximately \$5.2 billion, which would provide for environmental recovery and compensation over a period of 10 years. The same day, Brazilian President Dilma Rousseff blamed the disaster on the “irresponsible action of a company,” adding: “We are severely punishing those responsible for this tragedy.” In response to this news, Samarco’s bonds dropped an additional 19% or more.

17. Yet the end of the Class Period did not mark the end of the fallout for Defendants, resulting from the Samarco incident. In February 2016, two Samarco executives—CEO Ricardo Vescovi de Aragão (“Vescovi”) and Director of Operations Kleber Luiz de Mendonca Terra (“Terra”)—were charged by Brazilian State Prosecutors with “qualified homicide,” which in Brazil is murder aggravated by certain factors, such as a vile motive, for their roles in the dam collapse.

18. In May 2016, the Brazilian Federal Prosecutor’s Office commenced legal proceedings against BHP Brasil, Vale and Samarco seeking to recover approximately \$48 billion for social, environmental and economic compensation relating to the Fundão dam collapse.

19. On June 10, 2016, Brazil's federal police formally accused Samarco of deliberate misconduct in relation to the collapse, concluding, among other things, that Samarco had ignored clear warning signs that the Fundão dam was at risk of failing for years.

20. Most recently, on October 20, 2016, Brazil's Federal Prosecutor's Office filed criminal charges against Samarco, Vale, BHP Brasil, and some of their executives, managers, and board members, including Defendants Vescovi, Terra, Souza, Martins, Potter, Wilson, Zweig, Moreira, Fernandes, Rodrigues, and Beck. According to the lead prosecutor, Jose Leite Sampaio, "security was always of secondary importance. They deliberately prioritized money over safety."

21. In the wake of these issues, BHP and Vale announced the cessation of mining operations at Samarco for at least the first quarter of 2017. For its part, Samarco appears to be on the verge of bankruptcy. As reported by the Brazilian newspaper Estado de São Paulo ("Estadão") on October 29, 2016, "[w]ith overdue debts, Samarco already has a motion for reorganization on the table."

II. JURISDICTION AND VENUE

22. The federal claims asserted herein arise under and pursuant to Sections 10(b) and 20(a) of the Exchange Act [15 U.S.C. §§78j(b) and 78t(a)] and Rule 10b-5 promulgated thereunder by the SEC [17 C.F.R. §240.10b-5]. This Court has jurisdiction over the Exchange Act claims pursuant to 28 U.S.C. §1331 and Section 27 of the Exchange Act. This Court has jurisdiction over the state law claims pursuant to the Court's supplemental jurisdiction, 28 U.S.C. § 1367(a).

23. Moreover, Samarco has consented to the jurisdiction of the state and federal courts in the Borough of Manhattan, the State and City of New York, United States of America with respect to any action that may be brought in connection with the Indenture or the Notes,

which Plaintiff purchased, and has appointed Law Debenture Corporate Services Inc., as its authorized agent upon whom process may be served in any such action.

24. Venue is proper in this District pursuant to Section 27 of the Exchange Act and 28 U.S.C. §1391(b). Many of the acts charged herein, including the dissemination of materially false and misleading information, occurred in this District. Additionally, with respect to the debt securities at issue, Samarco raised money from transactions executed domestically in the United States, and has consented to the jurisdiction of the state and federal courts in the Borough of Manhattan, the State and City of New York, United States of America.

III. THE PARTIES

25. On January 20, 2017, the Court appointed Lead Plaintiff to lead the prosecution of this action. As set forth in Exhibit A attached hereto, Lead Plaintiff purchased Samarco bonds in domestic (U.S.) transactions during the Class Period and was damaged thereby. Specifically, Lead Plaintiff purchased Samarco bonds from counterparties and/or broker dealers located in the United States. As reflected in Exhibit A, Lead Plaintiff purchased the following Samarco bonds: 4.125% Notes due 2022 (ISIN: USP84050AA46), 5.75% Notes due 2023 (ISIN: USP84050AB29), and 5.375% Notes due 2024 (ISIN: USP84050AC02). These bonds were issued pursuant to the following Samarco offering memoranda: October 31, 2012; October 21, 2013; and September 23, 2014 (collectively, “Samarco’s Offering Memoranda”).

26. Samarco’s Offering Memoranda explained the following with respect to the “use of proceeds:” “We intend to use the net cash proceeds of this offering in connection with the P4P Project, which includes the expansion of our processing, logistics and production facilities, and for general corporate purposes.”

27. As for the governing law, Samarco's Offering Memoranda stated that "[t]he Indenture and the notes will be governed by and construed in accordance with the laws of the State of New York." Samarco designated the Bank of New York Mellon as trustee.

28. Defendant Samarco is a Brazilian company that describes itself as one of the largest seaborne exporters of iron pellets in the world and the second-largest in Brazil. Samarco owns and operates a fully integrated mining operation in the States of Minas Gerais and Espirito Santo, consisting of iron ore mines, associated logistics and processing facilities, and a maritime port. Samarco is a private company owned 50-50 by two leading global mining producers, BHP Billiton (through its fully-owned subsidiary, BHP Brasil) and Vale.

29. Defendant BHP Billiton describes itself as a leading global resources company and is among the world's top producers of major commodities, including iron ore. The company operates under a "Dual Listed Company" structure, comprised of BHP Billiton Limited ("BHP Ltd.") and BHP Billiton PLC ("BHP Plc"). BHP Billiton operates as a single economic entity by a unified board and management team. BHP Ltd.'s headquarters are located in Melbourne, Australia, while BHP Plc's headquarters are located in London, United Kingdom.

30. Defendant BHP Brasil is a fully-owned subsidiary of BHP Billiton Ltd. and BHP Plc., and its headquarters are located in Rio de Janeiro, Brazil. BHP Brasil is a 50% owner of Samarco.

31. Defendants BHP Ltd., BHP Plc. and BHP Brasil are sometimes collectively referred to herein as "the BHP Defendants."

32. Defendant Vale is a private-sector publicly traded company. It is the largest mining company in the Americas and one of the biggest in the world—it ranks number one in global production of iron ore, pellets, and nickel. The company, organized in 1943 under the

Brazilian laws, has operations in 26 countries, including the United States. It is headquartered in Rio de Janeiro, Brazil. Vale is a 50% owner of Samarco.

33. Defendant Ricardo Vescovi de Aragao (“Vescovi”) was the Chief Executive Officer (“CEO”) of Samarco during the Class Period. He was the Operations and Sustainability Officer of Samarco from 2006 until the end of 2011, when he became Samarco’s CEO. During the Class Period, Vescovi served as a member of Samarco’s Management Board. He also served as Sustainability and Operations Director. Vescovi has been on leave of absence from February 2016 to defend himself against criminal charges brought against him by the Brazilian Federal Prosecutor’s office. Vescovi was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

34. Defendant Kleber Luiz de Mendonca Terra (“Terra”) served as the Operations and Infrastructure Officer and Member of Executive Board at Samarco during the Class Period. Terra has been on leave of absence starting from February 2016 to defend himself against criminal charges brought against him by the Brazilian Federal Prosecutor’s Office. Terra was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

35. Defendant Maury Souza Junior (“Souza”) served as Mines and Pelletizing Operations General Manager since 2004 at Samarco, and became a Chief Project Officer in 2012. Souza was a member of Samarco’s Executive Board. Souza was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management

reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

36. Defendant José Carlos Martins (“Martins”) was Vale’s Executive for Ferrous Materials and Strategy, and was also responsible for Vale’s steel business. Martins served as a permanent member of Samarco’s Board of Directors from 2008 to 2014. Martins was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

37. Defendant Stephen Michael Potter (“Potter”) was appointed Director of Strategy of the Vale Global Strategic Planning Department in 2012 in the Ferrous Materials and Strategy Executive Department. Potter served as an alternate member of Samarco’s Board of Directors from 2012 to 2014 and became a permanent member in 2015. Potter was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

38. Defendant James John Wilson (“Wilson”) was an employee of BHP Billiton Ltd. and a member of the BHP Billiton Group Management Committee (“GMC”), reporting directly to Andrew Mackenzie, BHP Billiton’s Chief Executive Officer. Wilson served as a permanent member of Samarco’s Board of Directors from 2012 to 2015. Wilson was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

39. Defendant Jeffery Mark Zweig (“Zweig”) was an employee of BHP Billiton Ltd. and was the Vice President of BHP Billiton’s Strategy and Development of Iron Ore from February 2012 to October 2014. Zweig served as an alternate member of Samarco’s Board of Directors in 2012 and as a permanent member in 2013 and 2014. Zweig was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

40. Defendant Helio Cabral Moreira (“Moreira”) served as a permanent member of Samarco’s Board of Directors in 2012, 2013 and early 2014, and was appointed to that position by Vale. Moreira was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

41. Defendant Sérgio Consoli Fernandes (“Fernandes”) has been BHP Billiton’s Director of Iron Ore in the Americas since April, 2012. Fernandes served as an alternate member of Samarco’s Board of Directors from 2012 to 2015. Fernandes was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s sustainability reports, management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

42. Defendant Pedro José Rodrigues (“Rodrigues”) served as the Officer of Merger and Acquisitions and Investment Participations at Vale until 2015. Rodrigues served as a permanent member of Samarco’s Board of Directors in 2014 and 2015. Rodrigues was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s management reports,

interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

43. Defendant Margaret Beck (“Beck”) is a BHP Billiton Ltd. employee and has been BHP Billiton’s Vice President of Finance, Iron Ore, since March, 2009. Beck served as an alternate member of Samarco’s Board of Directors in 2014 and 2015. Beck was a maker of false and misleading statements appearing, *inter alia*, in Samarco’s management reports, interim and annual financial statements, and offering memoranda issued by Samarco during the Class Period.

44. Defendants described in paragraphs 33-43 above are collectively referred to herein as the “Individual Defendants.”

45. The Individual Defendants, together with Samarco, BHP, and Vale are referred to collectively as “Defendants.”

46. Because of the Individual Defendants’ positions with the companies, they had access to adverse undisclosed information about the companies’ business and operations, as detailed herein, via internal corporate documents, conversations and connections with other corporate officers and employees, attendance at management and/or Board meetings and committees thereof and via reports and other information provided to them in connection therewith. They also had the ability, and exercised the ability, to control the nature and content of information that the companies disseminated.

47. It is appropriate to treat Defendants as a group for pleading purposes and to presume that the false, misleading and incomplete information conveyed in the companies’ public filings, press releases and other publications as alleged herein are attributable to them. By virtue of their high-level positions with the companies, the Individual Defendants participated in the management of the companies, were involved in the day-to-day operations of the companies

at the highest levels, and were privy to confidential proprietary information concerning the companies and the false and misleading statements that were made. As detailed herein, they were involved in drafting, producing, reviewing and/or disseminating the false and misleading statements and information alleged herein; were aware, or recklessly disregarded, that the false and misleading statements were being issued; and approved or ratified these statements, in violation of the laws.

IV. WITNESSES REFERENCED HEREIN

48. Among the witnesses who provided sworn testimony to Brazilian prosecutors and/or police officers are the following individuals, each of whom gave statements which support an inference that Defendants knew, or recklessly disregarded, that serious problems existed at the Fundão dam during the Class Period, as detailed herein. A description of the accounts provided by these individuals is detailed below, and these accounts are discussed further herein.

(a) Wagner Milagres Alves (“Alves”), who gave testimony to the Prosecutor’s Office of the State of Minas Gerais on January 22, 2016, worked for BHP in Australia from 2003 to September 2012. In October 2012, Alves began working at Samarco as the mine planning manager and process engineer and, in October 2014, he became General Operations Manager for Mining at Samarco. As detailed herein, Alves testified concerning, among other things, that Samarco built a recess (setback) in the Fundão dam’s left abutment in order to address ongoing drainage problems with the dam, that no provision for the recess was included in the dam’s environmental permit, and that one of the piezometers used to monitor the dam continuously indicated an emergency situation in 2014 and 2015.

(b) Paulo Sergio Machado Ribeiro Filho (“Filho”), who provided testimony to the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas

Gerais on November 30, 2015, began working at Samarco as an Environmental Analyst beginning in October 2013 and is a member of Samarco's accident response team. As detailed herein, Filho testified concerning, among other things, that the Fundão dam had no audible alarm system and that he never received training on protocols in the event of a dam rupture.

(c) Paula Geraldo Alves, who provided testimony in the Police Investigation 1271-34.2016.4.01.3822 and also gave interviews to Brazilian journalists, was a contract employee working on Samarco's site when the dam collapsed. Alves testified that Samarco had never established an effective communication channel with the downstream communities, including Bento Rodrigues, or provided emergency training, even to contractor employees.

(d) Germano Silva Lopes ("Lopes"), who gave testimony to the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas Gerais on November 30, 2015, and to the Brazilian Federal Civil Service on December 14, 2015, began working at Samarco as the General Manager of Structure Projects beginning in March 2011. As detailed herein, Lopes testified concerning, among other things, that the Fundão dam was projected to receive approximately 20% more tailings in 2015 than in the period 2011 to 2014, that the dam was experiencing drainage and other problems before and during his tenure with Samarco, that an emergency action plan at Samarco was prepared in 2008 and was never updated or revised, and that this plan did not require notifying the residents of Bento Rodrigues in the event of an accident or dam rupture.

(e) Pimenta de Avila, who provided testimony to the Environmental Prosecuting Attorney for the Velhas and Paraopeba River Basins on January 18, 2016, and subsequently gave numerous media interviews, was contracted by Samarco to be the designer and builder of the Fundão dam. Pimenta de Avila served in this role from 2007 until July 2012.

Thereafter, beginning in November 2013, he was retained by Samarco as a consultant. As detailed herein, Pimenta de Avila testified concerning, among other things, that it was contemplated in 2007 that the Fundão dam would receive tailings waste from both Samarco and Vale mines, that the dam experienced severe drainage problems in 2009 and this information was communicated to the Samarco Board who subsequently authorized a design change to address this problem, that a deformation or “piping” caused problems at the dam between 2010 and 2012, that a September 2011 technical report he authored for Samarco warned that serious problems could arise if the dam was expanded, that he identified several cracks in the dam in September 2014, and that he observed numerous other problems when he visited the dam again in December 2014.

(f) Wanderson Silvério Silva (“Silva”), who provided testimony to the Brazilian Federal Prosecutors’ Office on August 7, 2016, was a senior geotechnical Engineer from Vale from July, 2007 to July, 2012, and became a Geotechnical Engineer in August, 2012. As detailed herein, Silva testified that the piezometers were not working properly at the time the dam collapsed. Specifically, on November 3, 4, and 5 of 2015, “no data was registered in the piezometer automatic system.” Silva also testified that all risks related to the setback implementation on the Fundão left abutment were expressly reported to his superiors, Germano Lopes (Geotechnical General Manager) and Daviely Rodrigues (Geotechnical and Hydrogeology Manager).

(g) Paulo Abrão (“Abrão”), who provided testimony to the Brazilian Federal Prosecutor’s Office on August 19, 2016, was a member of the Independent Tailings Review Board (“ITRB”) from 2009 to 2014, a committee of experienced technical advisors tasked with advising Samarco on its dams’ operations. As detailed herein, Abrão testified that Samarco

typically did not send a briefing of each dam to ITRB in advance of its meetings, a fact that interfered with ITRB's ability to properly and effectively evaluate the issues surrounding the Fundão dam. Abrão also testified that Samarco refused to follow ITRB's recommendation with respect to the transfer of sludge from Dike 2 to Dike 1A. Dike 1A was created in 2009 in order to enable Samarco to continue its operations when Dike 1 was temporarily closed. Abrão testified that sludge could be transferred from Dike 2 to Dike 1A only if the following conditions were met: (i) there would be no contamination of sandy tailings by slimes, and (ii) no raising of embankments would occur where sandy tailings and slimes were mixed.

(h) Daviely Rodrigues Silva ("Rodrigues Silva"), who provided testimony to the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas Gerais on November 30, 2015, and to the Brazilian Federal Civil Service on December 10, 2015, began working at Samarco in 2001 and is currently the Manager of Soil Science and Hydrogeology. As detailed herein, Rodrigues Silva testified concerning, among other things, that the Fundão dam experienced severe drainage problems in 2009 and that the dam experienced a deformation or "piping" in 2010.

(i) Euzimar Augusto da Rocha Rosado ("Rosado"), who provided testimony to the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas Gerais on November 30, 2015, began working at Samarco in February 1998 and is currently an Environmental Coordinator. As detailed herein, Rosado testified concerning, among other things that production of iron ore at Samarco increased by about 30-40% in the year before the Fundão dam collapse as a result of the P4P Project being placed into operation.

(j) Gleison Alexandrino Souza ("Souza"), who provided testimony to the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas Gerais

on November 18, 2015, is a mason who worked for a contractor that performed work on the Fundão dam, has lived in Bento Rodrigues for 31 years, and was in Bento Rodrigues when the Fundão dam collapsed. As detailed herein, Souza testified concerning, among other things, that he witnessed a crack in the Fundão dam in 2014 which had water flowing out of it, that everyone knew about the crack, that Samarco never conducted any training with the Bento Rodrigues community for emergency situations, and that no statements or warnings were issued to the community after the dam collapsed.

(k) Paulo Roberto Bandeira (“Bandeira”), a Vale General Manager responsible for providing information to Brazil’s National Department of Mineral Production (“DNPM”) regarding Samarco’s Economic Mining Plan (PAE) and Mining Annual Reports (RAL) in 2013, 2014, and 2015, testified on September 7, 2016 that Defendants failed to inform the supervisory Brazilian authorities that Vale was discharging its tailings into the Fundão dam.

49. In addition to the foregoing witnesses, other individuals with relevant knowledge about, among other things, the status of the various investigations in Brazil relating to the Fundão dam collapse, the lack of an adequate emergency plan at Samarco, and the chemical composition of the mudflow from the Fundão dam collapse, include those individuals described below.

(l) Dr. Nikola Casule (“Casule”), a representative of Greenpeace, posed questions through proxies to BHP executives Nasser and Mackenzie at BHP Ltd.’s annual general meeting on November 19, 2015 (the “11/19/15 AGM”) concerning the Fundão dam collapse, which resulted in Nasser admitting that BHP knew about the Pristino Report in 2013.

(m) Fonseca, director of RTI Consulting, was retained by Samarco in 2009 to create an emergency action plan for its mining units, including the Germano complex and the

Fundão dam. As detailed herein, Fonseca provided information to journalists regarding, among other things, that he had designed a new emergency action plan for Samarco which would cost a mere \$1.5 million, would have given Samarco the ability to monitor its tailings dam on a second-by-second basis, and would have included training for employees and residents near the dam, but this plan was rejected by the Samarco Board for being too expensive.

(n) John Knox (“Knox”), the Special Rapporteur for the United Nations on human rights and the environment, announced on November 25, 2015 that, among other things, based on independent scientific tests commissioned by authorities in Minas Gerais and Espírito Santo, the mudflow from the Fundão dam collapse contained elevated levels of toxic heavy metals such as arsenic, barium and manganese.

(o) Leonardo Pedrosa (“Pedrosa”), a DNPM engineer, similarly testified to the Brazilian Federal Prosecutor’s Office on March 28, 2016 that Defendants failed to inform DNPM that Vale was discharging its tailings into the Fundão Dam without communicating this fact to the DNPM. He also identified, during an inspection after Fundão dam’s collapse that Samarco authorized Vale to extract iron from Alegria Norte, a mining complex operated by Samarco.

(p) Guilherme Santana Lopes (“Lopes”), a Mining Resources specialist from the DNPM, also confirmed in testimony to Brazilian Federal Prosecutors on March 28, 2016 that Vale not only used the Fundão dam to discharge its waste, but also had a barter trade agreement to extract iron from a mine controlled by Samarco. As stated by Lopes, “the DNPM had no knowledge of this bartering of areas.”

(q) Roger Lima de Moura (“Moura”), the head of the Brazilian Federal Police task force, provided information to journalists regarding, among other things, his belief that the

Fundão dam collapse should not be characterized as an accident because it was caused by negligence from top executives at Samarco, and that prior to the collapse Samarco executives had discussed purchasing Bento Rodrigues so that it could relocate the village. As support for his statements, Moura cited to the results of a seven-month investigation into the dam collapse conducted by Brazilian police. In addition, according to documents from the Brazilian Federal Civil Service, Moura was present at the December 9, 2015 testimony given by Rodrigues Silva, the December 14, 2015 testimony given by Germano Lopes, and when testimony was given by ten other Samarco employees on December 9 and 10, 2015.

(r) Carlos Eduardo Pinto (“Pinto”), a Brazilian state prosecutor, provided information to journalists regarding, among other things, his belief that the Fundão dam did not break by chance. In addition, according to documents from the Environmental Conflicts Resolution Office for the Public Ministry of the State of Minas Gerais, Pinto was present at the November 30, 2015 testimony given by Rodrigues Silva and the November 30, 2015 testimony given by Rosado.

(s) José Adércio Leite Sampaio (“Sampaio”), a Brazilian federal prosecutor, learned, according to *The Wall Street Journal* that between 2012 and 2015, the volume of tailings at the Fundão dam grew from 5 million cubic meters to 55 million cubic meters, an increase of approximately 1100%, and that several of the 50 piezometers in the dam’s walls indicated emergency levels of pressure and stress before the collapse.

(t) Baskut Tuncak (“Tuncak”), the Special Rapporteur for the United Nations on human rights implications on hazardous substances, announced on November 25, 2015 that, among other things, based on independent scientific tests commissioned by authorities in Minas

Gerais and Espirito Santo, the mudflow from the Fundão dam collapse contained elevated levels of toxic heavy metals such as arsenic, barium and manganese.

50. The accounts of these witnesses are further described below, and collectively support the inference that the risks facing, and precarious condition of, the Fundão dam were well known to Defendants.

V. SUBSTANTIVE ALLEGATIONS

A. Background of Samarco

1. Samarco's Business and Formation

51. Samarco is based in Belo Horizonte, Brazil, which is located in the Brazilian state of Minas Gerais. Samarco owns and operates iron ore mines and iron ore processing facilities in and around the municipalities of Bento Rodrigues and Mariana, which are also located in Minas Gerais. Samarco also owns and operates pellet processing facilities and a port located in the municipality of Anchieta, which is located in the Brazilian state of Espírito Santo, the state adjacent to Minas Gerais, which borders the Atlantic Ocean.

52. Samarco's main mining complex is known as the Germano complex, which consists of two mines, three beneficiation plants, three slurry pipelines used to move tailings and other materials, and two tailings dams—the Fundão Dam and the Germano Dam—to store the waste materials created by the iron ore mining process, as well as the Santarém Dam, where treated wastewater is stored for future use. Conveyor systems are used to extract iron ore and transport it from the mines. Iron ore beneficiation then occurs in concentrators, where crushing, milling, de-sliming and flotation processes produce iron concentrate. Concentrate leaves the concentrators as slurry and is pumped through pipelines to pellet plants in Anchieta, where it is processed into pellets. The iron ore pellets are then heat treated and stored in a stockpile yard before being shipped out of Samarco's port.

53. Samarco was formed in 1973 by S.A. Mineração da Trindade (“SAMITRI”) and Marcona Corporation, with SAMITRI owning 51% and Marcona Corporation owning 49%. In 1977, Marcona Corporation was sold to Utah International and became Utah Marcona Corp. In 1978, Utah Marcona Corp. was sold to General Electric.

54. In 1984, BHP purchased Utah Marcona Corp. from General Electric and thus acquired its 49% stake in Samarco. In 2000, Vale purchased SAMITRI. Shortly thereafter, BHP and Vale conducted a shareholder reorganization of Samarco which resulted in joint ownership of Samarco by BHP Brasil and Vale. Each of BHP Brasil and Vale holds a 50% interest in Samarco.

2. Samarco’s Organizational Structure and its Control by BHP and Vale

55. Given its ownership structure, Samarco is operated by an eight-member Board of Directors comprised of four representatives of each of BHP and Vale (two active directors each and two alternate directors each).

56. The control BHP and Vale exercise over Samarco is clear. According to a December 5, 2014 Samarco presentation titled “Corporate Governance in a Joint Venture,” *“Samarco as a joint venture acts in accordance with shareholder decisions, rather than pursuing its own business purpose.”* The presentation also pointed out Samarco’s characteristics:

- Negotiations and agreements format of the joint venture that aim to benefit both parties;
- Scope is *maximizing value in line with the decisions made by shareholders*;
- *Board of Directors members represent the interests of the shareholders*;
- *The Executive Board has limited power to decide more strategic issues, requiring prior agreement among shareholders.*

(emphasis added).

57. During the Class Period, Samarco's Board of Directors had the power to define the strategic and general direction of the business; control the business results; ensure the integrity of management; appoint the CEO and monitor, manage and evaluate the performance of other corporate bodies; conduct and approve company policies; conduct and approve the company's business plans and budget, including its investments and dividend distributions; deliberate on matters related to the company's capital structure; deliberate on matters related to the company's business model; and ensure the company's compliance with laws and regulations.

58. According to Samarco's bylaws, the Board of Directors was also responsible for: setting the general orientation of the company's business; electing and removing the executives of the company; analyzing the books and records of the company; convening general meetings; reviewing contracts; giving opinion on the management report and on the accounts of the Executive Board; choosing and removing the independent auditors; approving the company's business plans, revisions, and additions; approving the company's mining plan (and any revisions and additions), including the quantity and quality of the company's mining production; approving expansions; approving technical matters such as reserves and mineral data; monitoring purchasing, management, maintenance, and production; and deliberating on any matters that were not under the gambit of the duties of the General Assembly or the Board of Executive Officers.

59. Samarco's Board of Directors was the body responsible for organizing, coordinating and supervising the company's activities.

60. According to Samarco's 2014 Report of Management and Financial Statements, the Samarco Board had the ultimate responsibility for directing and managing Samarco's business and mining activities. The Samarco Board's "duties include establishing strategic

guidance, approving business plans, investments and budgets, and monitoring the Company's performance. Other functions of the Board include approving dividend distributions to shareholders and reinvestment, and deciding on changes to the capital structure." According to Samarco's 2012 Annual Report, the Samarco Board is also responsible for ensuring a yearly independent audit of Samarco, appointing Samarco's CEO, evaluating Samarco's executives, and guaranteeing the integrity of Samarco's management. According to Samarco's Sustainability Report, the company's Board of Directors: sets the business and strategy guidelines; directs and approves the organization's business plans and budgets, including equity investments; approves the distribution of dividends to shareholders and reinvestments; monitors the company's results; ensures the integrity of management; elects the CEO and evaluates the members of the Executive Board; defines independent auditors; and decides on changes to Samarco's capital structure.

61. As stated in Samarco's Sustainability Reports, during the Class Period:

"[s]upported by the pillars of transparency and trust, Samarco maintain[ed] a close relationship with its two shareholders—BHP Billiton Brasil Ltda. and Vale S.A.—through its Board of Directors, the main liaison between the Company's corporate and governance bodies. It is the Board that decides on issues addressed by the existing committees and subcommittees, reporting on them in meetings with the shareholders. In the general shareholder meetings, the Board endorses the shareholders' decisions from the perspective of Brazilian legislation, analyzing them from the standpoint of business compliance and profitability."

62. BHP Brasil and Vale's control over Samarco was also noted by the Brazilian Federal Judge Marcelo Aguiar Machado, who found both controlling companies also responsible for the environmental damages caused by the Fundão dam failure.

63. Judge Machado held that "Vale S/A and BHP Billiton Brasil Ltda., while acting as controlling entities for Samarco Mineração S/A, not only benefitted from the mining activities developed by Samarco, but were also jointly responsible for decisions at the company." "The

controlling companies' benefits are, therefore, compensated with their duties established by Brazilian corporate law and the resulting responsibilities for damages."

64. According to the Brazilian corporate law invoked by Judge Machado, Vale S/A and BHP Brasil "shall use [their] controlling power in order to make the corporation accomplish its purpose and perform its social role, and shall have duties and responsibilities towards the other shareholders of the corporation, those who work for the corporation and the community in which it operates, the rights and interests of which the controlling shareholder must loyally respect and heed." (article 116 of Law 6.404/1976).

65. Judge Machado's decision was affirmed by the Brazilian Federal Court of Appeals (Tribunal Regional Federal da 1ª Região) on the same grounds.

66. During the Class Period, Samarco's Board of Directors was largely responsible for implementing the reckless policy related to the operation of the Fundão dam, prioritizing the expansion of production and dividend distribution at the expense of safety.

67. The following Vale representatives served as members of Samarco's Board of Directors:

- José Carlos Martins was a permanent member from 2008 to 2014;
- Helio Cabral was a permanent member in 2012, 2013 and early 2014;
- Pedro José Rodrigues was a permanent member in 2014 and 2015;
- Stephen Michael Potter was a permanent member in 2015 and an alternate member from 2012 to 2014;

68. The following BHP representatives served as members of Samarco's Board of Directors:

- James John Wilson was a permanent member from 2012 to 2015;
- Jeffery Mark Zweig was a permanent member in 2013 and 2014, and an alternate member in 2012;

- Sérgio Consoli Fernandes was an alternate member from 2012 to 2015; and
- Margaret Beck was an alternate member in 2014 and in 2015.

69. According to Samarco's 2013 Sustainability Report and the General Meetings Minutes published on Official Gazette of the State of Minas Gerais, the members of Samarco's Board of Directors are appointed by its shareholders, BHP Brasil and Vale.

70. In addition to serving on the Samarco Board, BHP and Vale executives also served on the four Samarco Board committees responsible for overseeing Samarco's operations, including the Management Committee for the P4P Project, as follows:

- **P4P Project Management Committee:** responsible for, among other things, "support[ing] the Board of Directors and the Project team in making important decisions on the [P4P] project[,] review and monitor the key performance indicators for the [P4P] project, including results for safety, physical and financial progress and cost performance[,] analyze risk management, internal controls, compliance [emphasis in original] and related improvement plans[,] analyze external and internal audit reports and monitor the progress of the related action plans[,] analyze and approve changes in the scope, schedule, specifications, and/or budget, within approval limits [and] review and advise the Board of Directors regarding requests related to changes in scope, schedule, specifications, and/or budget which exceed the Committee's approval limits." BHP representatives: Fernandes and Guilherme Campos Ferreira ("Ferreira"). Vale representatives: Luiz Eduardo Lopes and Eduardo Araujo.
- **Operations Committee:** responsible for, among other things, monitoring Samarco's "operational performance [related to] Health and Safety, environment and community, sales, production, costs, inventories, etc.[]]" as well as "technical evaluation of new resources" and evaluation and monitoring of capital projects. The Operations Committee provides support to Samarco's Board of Directors on technical matters and issues related to operations, with three subcommittees: Performance Management, Capital Projects, and Technical. BHP representatives: Fernandes and Ferreira. Vale representatives: Stephen Potter and Paulo Bandeira.
- **Finance and Strategy Committee:** responsible for, among other things, "defin[ing] parameters and monitor[ing]" Samarco's "strategic plan[,] annual and multiannual budget[, and] capital structure[,] and "review internal and external audit reports and monitor the progress of the related action plans." The Finance and Strategy Committee assists Samarco's Board of Directors in strategic, economic, and financial affairs. There are three subcommittees: Taxes and Contingencies, Treasury, and Audit. BHP representatives: Fernandes and Andre Cardoso. Vale

representatives: Stephen Potter, Hélio Cabral, Cléber Santiago, and Maria Inês Carvalheiro.

- **Compensation Committee:** responsible for, among other things, “monitor[ing] the effectiveness of management in delivering results and executing strategies in relation to approved budgets/plans” and “defin[ing] and supervis[ing] the process of evaluating the CEO and senior executives. BHP representative: Wilson. Vale representative: José Carlos Martins.

71. The Samarco Board minutes from December 4, 2013 through April 15, 2015, do not indicate that any of BHP or Vale’s representatives were removed from, or added to, these committees during such time. In fact, only at the August 5, 2015 meeting, the Board of Directors approved the nomination of new members for the Governance committees and subcommittees. The P4P Project Management Committee was disbanded at the December 10, 2014 Samarco Board meeting because the P4P Project concluded around that time.

72. The Samarco Board met at least three times each year, typically in April, August/September, and December. BHP executives, including at least Wilson and/or Consoli attended every meeting. Similarly, three Vale representatives, Hélio Cabral, Pedro Rodrigues and Stephen Potter, attended all Board meetings during the Class Period.

73. According to the minutes of the various meetings, the topics discussed included, among others: (i) the P4P Project (4/4/12, 8/8/12, 12/7/12, 4/4/13, 8/14/13, 12/4/13, 4/2/14, 9/19/14 and 12/10/14 meetings); (ii) raising the elevation levels of the Fundão dam and the Germano dam (4/15/15 and 8/5/2015 meetings); (iii) tailings storage, the ongoing risks associated with tailings storage, and the need for future tailings storage capacity (8/8/12, 12/7/12, 4/4/13, 12/4/13, 4/2/14, 9/19/14, 12/10/14 and 4/15/15 meetings); (iv) necessary operation and safety performance and improvements (4/4/12, 8/8/12, 12/7/12, 4/4/13, 8/14/13, 12/14/13, 4/2/14, 9/19/14, 12/10/14, 4/15/15 and 8/5/2015 meetings); (v) the licensing of various mining operations and tailings storage facilities (12/7/12, 12/4/13, 4/2/14, 4/15/15 and 8/5/2015

meetings); (vi) shareholder audit results (12/7/12, 12/4/13, and 12/10/14 meetings); and (vii) the status of various other capital projects (4/4/12, 8/8/12, 12/7/12, 4/4/13, 8/14/13, 12/4/13, 4/2/14, 9/19/14, 12/10/14, 4/15/15 and 8/5/2015 meetings).

74. Throughout the Class Period, in accordance with Samarco's bylaws, executives and other high-level employees from Vale and BHP were also members of or were present at Samarco's General Meetings, and had the power to deliberate on all matters related to the company's business and to take such steps as they deemed appropriate to defend the company's development. Vale and BHP representatives were also members of or were present at Samarco Committees and Advisory Subcommittees, such as Samarco's Finance & Strategy Committee and Remuneration Committee, and made decisions concerning Samarco's allocation of profits and its distribution of dividends.

75. In addition, high-level representatives from Vale and BHP sat on Samarco's Committees of Operation and Operational Performance, which aimed to (i) define guidelines and monitor Samarco's operations; (ii) evaluate and improve management capacity; (iii) evaluate and monitor capital projects and investment performance; and (iv) promote technical innovations. These committees were responsible for assisting Samarco's Board of Directors with legal and compliance matters. The committees, which typically met three times a year, also advised Samarco's Board of Directors on matters related to investment, with the goal of maximizing returns to shareholders BHP Brasil and Vale.

76. During most of the Class Period (from December 4 2013 to August 5, 2015), the Committees included the following BHP and Vale representatives:

- Finance & Strategy Committee

BHP	VALE
Sérgio Consoli Fernandes (Chairman)	Stephen Potter

Andre Cardoso	Helio Cabral
	Cleber Santiago
	Maria Inês Carvalheiro

- Operations Committee

BHP	VALE
Sérgio Consoli Fernandes	Stephen Potter (Chairman)
Guilherme Campos Ferreira	Paulo Batista

- P4P Committee

BHP	VALE
Sérgio Consoli Fernandes	Luis Eduardo Lopes
Guilherme Campos Ferreira	Rodrigo Araújo
	Maurício Drumond

- Compensation Committee

BHP	VALE
James John Wilson	José Carlos Martins (Chairman)

77. The Operational Performance Committee was responsible for “defining the operational improvement plan” and “analyzing and monitoring the company’s operational performance.” Its members were fully aware of the problems, flaws or nonconformities that were constantly identified in the Fundão dam.

78. The Operations Committee, in turn, was the body to which the Subcommittee on Operational Performance was subordinated, and it was responsible for advising the Board of Directors on all operations and technical matters. All information submitted to the Operations Committee and the Operational Performance Committee was received by Samarco’s Board of Directors, since each committee was required to have at least two representatives on the Board of Directors.

79. In the meantime, during the Class Period, the Executive Board was responsible for: establishing the direction of the business *in accordance with the directives of the*

shareholders and by means of rendering of all accounts; preparing and proposing the business strategy to Samarco's Board of Directors; developing and proposing, among other matters, general policies, business objectives, and the code of conduct to the Board of Directors; operating within the limits defined by the Board of Directors; identifying and proposing business opportunities to the Board of Directors; and ensuring the legal and corporate compliance of Samarco.

80. During the Class Period, Samarco's CEO was responsible for planning, organizing, leading and controlling all of Samarco's activities *in line with the objectives and strategies established by BHP and Vale*, in order to achieve the output and profitability projected.

81. During the Class Period, among other things, Samarco's Executive Board received periodic reports and information on the operations of the Fundão tailing system at the ITRB meetings. As previously described, ITRB is a collegiate body comprised of independent experts who review all tailings impoundments and provide Samarco's Executive Board and top management with recommendation on design, construction, operation and closure. During the Class Period, the Executive Board also received reports and participated in monitoring the risks of "critical failure in the dam operation process" and "critical failure in the implementation process of dams and sterile piles."

82. During the Class Period, Samarco's management was responsible for the preparation and fair presentation of the company's management reports and financial statements. According to Samarco's bylaws, the management of the company is performed by Samarco's Board of Directors and Samarco's Executive Board. The management of Samarco was also responsible for the preparation and fair presentation of the information included in the

Sustainability Reports and for such internal controls as the management determined were necessary to enable the preparation of information free from material misstatements, whether due to fraud or error.

83. During the Class Period, Samarco also had a Dam Committee, which was created before the Fundão dam became operational. According to its charter, this committee was responsible for: periodically assessing the status of tailings dams and water; analyzing and approving the results of technical dams audits; evaluating the management of the dams; evaluating compliance with the action plans resulting from audits; and making recommendations related to the improvement of the auditing and management processes of the dams. During the Class Period, the following Samarco employees were members of the Dam Committee: Ricardo Vescovi (CEO), Kleber Terra (Operations and Infrastructure Officer), José Luis Santiago (Project General Manager), João Pedro (Mining Operation General Manager), Maury de Souza (Engineer and Projects Officer), Márcio Perdigão (Environmental Licensing Manager), Germano Lopes (Geotechnical General Manager), Daviely Rodrigues (Geotechnical and Hydrogeology Manager), and Bruno D'Angelo (Process Engineer).

84. Typically, meetings of the Dams Committee occurred quarterly. At the close of each Annual International Audit, a meeting of the Dams Committee was also held to evaluate the results. In the event of an accident occurring at the dams, an extraordinary meeting would be convened by the Mine Operations General Manager within 48 hours of the event's occurrence. The Dams Committee was tasked with overseeing the construction and operation of the Fundão dam. Samarco's CEO, Defendant Vescovi, as well as Samarco's Operations and Infrastructure Officer, Defendant Terra, participated in all of the Dams Committee meetings during the Class

Period. All failures identified during the construction and operation of Fundão were brought to the Committee's attention during the Class Period.

85. BHP, along with Vale, audited Samarco each year. The results of these audits were presented to the Samarco Board each year, whereupon the results were discussed by the Samarco Board and the proposed scope of the following year's audit was also discussed.

B. The Use and Known Risks in the Industry of Upstream Tailings Dams

86. As part of the Germano complex, Samarco constructed and maintained three dams, including the Fundão tailings dam. Before its collapse, Minas Gerais officials classified the Fundão dam as Class III, meaning it had the greatest potential for environmental damage. The classification was warranted.

87. Tailings dams are generally constructed in stages, with embankments raised as mine and waste output increases. Because tailings may contain harmful elements used in mining and processing ore, it is extremely important to ensure that the tailings remain contained and do not contaminate the surrounding area and populace. In fact, Samarco has acknowledged that its primary challenge was to safely dispose of the tailings resulting from iron ore processing at its sites in Brazil.

88. Tailings ponds are a notoriously dangerous way to manage and store tailings, as compared to dry stacking or other methods which eliminate the persistent risk of tailings breaches or contamination. In fact, a July 21, 2015 report entitled "The Risk, Public Liability, & Economics of Tailings Storage Facility Failures," identified an alarming trend in catastrophic tailings dam failures resulting from increased mining and production, driven by, among other things: (i) lower excavation and processing costs; (ii) the ability to process lower grades of material based on technological advances; and (iii) declining metal prices. As the report cautioned:

[M]any of the same features of modern mining that create economic feasibility in lower grades of ore also pose greater challenges for the management of mine waste and waste water. One of the manifestations of these challenges overall is a greater frequency of Very Serious tailings dam failures [i.e., having a release of at least 1 million cubic meters, and/or a release that travelled 20 Km or more, and/or multiple deaths (generally ≥ 20)] with significant levels of social and economic consequence, sometimes non remediable.

89. Tailings dams typically are built in sequential “lifts” over several years that increase the size and height of the dam throughout the life of the particular mine(s) it services. Typically, a base or starter dam is constructed and, as it fills with a mixture of tailings and water, is raised to accommodate additional waste. Materials used to raise the dam often include tailings themselves. These unique features lead to concerns over quality control in both design and construction.

90. The International Commission on Large Dams (“ICOLD”) described these concerns in a 2001 bulletin (*Tailings Dams, Risk of Dangerous Occurrences, Lessons Learnt from Practical Experiences*, Bulletin 121, ICOLD, 2001), as follows:

Causes (for dam failures) in many cases could be attributed to lack of attention to detail. The slow construction of tailings dams can span many staff changes, and sometimes changes of ownership. Original design heights often are exceeded and the properties of the tailings can change.

* * *

[Although] the technical knowledge exists to allow tailings dams to be built and operated at low risk, [] that accidents occur frequently because of lapses in the consistent application of expertise over the full life of a facility and because of lack of attention to detail.

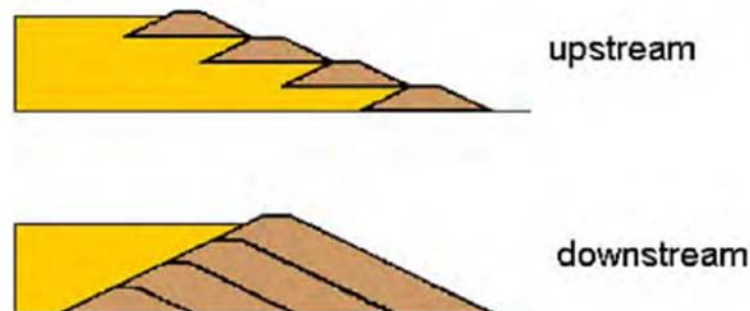
* * *

By highlighting the continuing frequency with which (dam failures) are occurring and the severe consequences of many of the cases, this Bulletin provides prima facie evidence that commensurate attention is not yet being paid by all concerned to safe tailings management.

* * *

[T]he mining industry operates with a continual imperative to cut costs due to the relentless reduction in real prices for minerals which has been experienced over the long term, plus the low margins and low return on capital which are the norm. The result has been a shedding of manpower to the point where companies may no longer have sufficient expertise in the range of engineering and operational skills which apply to the management of tailings.

91. Tailings dams are built using “upstream” design and construction—a cheaper, less reliable, and less stable method than “downstream” construction, which is the safest, but most expensive method. Upstream tailings dams are far less secure because they rely on the stability of the tailings themselves as a foundation for the construction. The following graphic, taken from a study by David M. Chambers and Bretwood Higman, *Long Term Risks of Tailings Dam Failure*, dated October 2011 (the “Chambers and Higman Study”), shows the difference in construction methods:



92. In an article entitled “Mining Dams Grow to Colossal Heights, and So Do the Risks,” dated April 5, 2016 (the “4/5/16 Article”), *The Wall Street Journal* explained how upstream construction works:

“Upstream” design . . . involves letting the tailings closest to the dam dryout. These dry tailings are then used as the foundation for new levels, raised by plowing earth or tailings into successive embankments. As it requires the least amount of bulldozing, the upstream method is the least expensive way of building a tailings dam and was employed by Samarco.

93. According to the 4/5/16 Article, some countries have banned the upstream tailings dam design.

94. Upstream dams built on tailings are more susceptible to liquefaction, a physical phenomenon in which the strength and stiffness of soil is reduced by either dynamic forces (like an earthquake or other rapid loading) or static forces (such as slope instability or the buildup of water pressures unrelated to dynamic forces). According to Davies, McRoberts, and Martin, the authors of a paper on the history of tailings dam failures entitled “Static Liquefaction of Tailings – Fundamental and Case Histories,” static liquefaction likely is the most common cause of tailings dam failures.

95. The 4/5/16 Article reported that “[s]cientists say the typical culprit for tailings accidents is too much water, which can cause earthen dams to liquefy.” The following graphic reprinted from the Wall Street Journal illustrates the risks of upstream tailings dams:

Tailings Dam Risks



Water

Water is a tailings dam's worst enemy. If it saturates the dam walls or the tailings beneath an upstream dam, the whole structure can liquefy and slide. Wetter tailings also travel farther and faster if they escape, causing more destruction.



Weak Foundation

An undetected layer of clay or silt beneath a tailings dam can prove disastrous. In addition to being less sturdy than rock or sand, such materials drain poorly, allowing water to silently infiltrate the dam.



Rate of Rise

Upstream tailings dams should be raised slowly, to allow the beach time to dry and consolidate enough to support a new level of the dam. But this requires a level of discipline that can test mining companies.

96. Tailings dams are not designed to hold substantial amounts of water. Indeed, water is the number one enemy of tailings dams, as too much water makes tailings dams unstable and greatly increases the risk of collapse. Accordingly, great care must be taken not to raise the level of an upstream dam too quickly to ensure that the tailings used to construct the “lifts” have

sufficient time to dry out before additional lifts are added. If the tailings do not dry sufficiently, the risk of a collapse increases significantly.

97. When iron prices fall (as they did during the Class Period), mining companies must increase production and reduce costs and capital expenditures to remain profitable. One way to increase production is to mine increasingly lower-grade ores. Mining lower-grade ore, however, produces more tailings waste, creating the need for bigger and taller tailings dams. Not surprisingly, as the size of tailings dams increases, so too does the incidence and risk of catastrophic failures. Simply stated, the bigger and taller the tailings dam, the greater the risk of failure—and the greater the harm, if it fails.

98. Experts estimate that tailings dams fail at a rate ten times greater than conventional dams. According to the Chambers and Higman Study, on average, between 2001 and 2011 there was one tailings dam failure every eight months. There were two catastrophic failures in 2014: one that killed two people at a mine in Minas Gerais, near the Fundão Dam and the Germano complex; and another that occurred at the Mount Polley mine in Canada, resulting in one of the worst environmental disasters in Canadian history. A report on Mining, Minerals and Sustainable Development, published by the International Institute for Environment and Development, concluded that tailings dams typically represent the most significant environmental liability associated with mining operations. According to the 4/5/16 Article, a consultant who has designed a number of very large tailings dams for mining companies was quoted as saying “[o]ur dams and dumps are among the highest-risk structures on Earth.”

99. The 4/5/16 Article also reported that a 2009 study of 42 years of accident data found that tailings dams fail much more frequently when commodity prices fall, suggesting a

correlation with increased pressure to cut costs “once mines constructed on the basis of rising commodity prices are forced to operate with the reality of lower commodity prices.”

100. According to the Center for Science in Public Participation, the rate of serious design failures in tailings dams is increasing. Nearly half of serious tailings dam failures in the last 70 years occurred in the 20 years between 1990 and 2009. The increasing rate of design failures in tailings dams is directly related to the increasing number of tailings dams larger than 5 million cubic meters—the capacity needed to allow lower grades of iron ore to be extracted economically.

101. Underscoring the extensive, known risks in the mining industry associated with upstream tailings dams is a push by Brazilian legislators to ban such dams in the wake of the Fundão dam collapse. The proposal would toughen supervision and maintenance at existing waste storage facilities in Minas Gerais and ban construction of upstream tailing dams.

C. Samarco’s P4P Project Increased Demands on its Tailings Dams

102. Beginning in early 2013, nearly three years before the Fundão dam collapsed, the price of iron ore plummeted. In February 2013, iron ore traded at \$154.64 per dry metric ton. By November 2015, when the Fundão dam collapsed, the price had sunk to \$46.16, a decline of more than 70% and the lowest price that iron ore had traded at since early 2008.

103. As detailed above, as iron prices plummet, the pressure on mining companies to increase production and cut costs grows enormously. Samarco was not immune to these pressures, and responded by dramatically increasing production to record levels.

104. Before the Class Period, Samarco approved the P4P Project, a \$3.5 billion expansion project, known as the Fourth Pellet Plant Project, consisting of the construction of a fourth pellet plant, a new concentrator and a third slurry pipeline. BHP and Vale funded at least \$1.75 billion of the total project price.

105. As of September 2014, the P4P Project was complete, with the first pellet production from the P4P Project having begun months earlier, in March 2014. The P4P Project dramatically increased Samarco's iron ore pellet production capacity—from 22.3 Mtpa to 30.5 Mtpa, an increase of nearly 37%. Accordingly, the P4P Project provided Samarco with the ability to significantly ramp up iron ore pellet production beginning in late 2014.

106. Additionally, the P4P Project was completed significantly under budget. BHP Billiton's 2014 Form 20-F indicated that the final cost of the project was \$3.2 billion (\$1.6 billion BHP share), meaning that BHP and Vale were each able to save \$150 million against the approved budget of \$3.5 billion.

107. Despite the cost savings associated with the completion of the P4P Project, the P4P Project did not contemplate the design or implementation of a new tailings dam to accommodate the explosive growth in production at Samarco, or the equally explosive growth in tailings waste that would result.

108. According to testimony provided by Rosado, a Samarco environmental coordinator responsible for the environmental management of ongoing projects, production of iron ore at the Germano complex increased by "around 9 million tons" in the last year before the collapse, an increase of approximately 30-40% over the previous year. Rosado confirmed that this increase was because "a 'fourth pelletizing [plant]' was placed into operation," *i.e.*, the P4P Project.

109. According to testimony provided by Lopes, the general manager of structure projects at Samarco, the Fundão dam was projected "to receive around 18 million cubic meters" of tailings waste in 2015, approximately 20% more than in the period between 2011 and 2014.

D. The Risks Posed by Samarco's Tailings Disposal and Storage Practices

1. The Samarco Board Frequently Discussed Tailings Issues

110. Handling the excess waste resulting from Samarco's increase in production, and the corresponding risk posed by overtaking Samarco's tailings dams, was a principal topic of concern for the Samarco Board both before and during the Class Period. These issues were discussed extensively at meetings of the Samarco Board, as reflected in minutes taken at those meetings. Yet Defendants consciously or recklessly disregarded the risks posed by this increase in tailings and Samarco's failure to implement a viable plan to handle the increase in tailings.

111. According to the August 8, 2012 minutes of a meeting of the Samarco Board, the Board "reiterated the importance of the projects related to the tailings storage facilities, and it recommended that Samarco prioritize efforts to resettle the communities near the tailings dams." At that same meeting, the Samarco Board requested that Samarco's management "include specific plans for the tailings dams (covering the activities related to communities in the area)." Wilson, Vescovi, and Terra were present at this meeting.

112. According to Brazilian newspaper *Estadão*, the federal police investigation report uncovered Samarco emails including, in pertinent part, on August 15, 2012, when Terra informed Lopes that "shareholders want to remove people from Bento in any possible way . . . We will have to perform a thorough case study, including simulation of a rupture of the current structure. To see which would be the real damage" According to *Estadão*, federal police believed Samarco considered purchasing the Bento Rodrigues village, but concluded that it would be faster and easier to build a new tailings dam. Samarco ultimately did neither.

113. According to the December 7, 2012 Samarco Board minutes, Terra presented an overview of Samarco's tailings dams to the Samarco Board, including, among other topics, "dam management and risk control." In response to this presentation, the Samarco Board "stressed

that the tailings facilities are critical (including continuous management/improvement of installations already in existence and needed expansions), and it recommended that Samarco maintain its focus on the design and implementation of the tailings process as a matter of priority.” James Wilson, José Carlos Martins, Jeffery Zweig, Sérgio Consoli Fernandes, Steve Potter, Hélio Cabral Moreira and Ricardo Vescovi were also present at this meeting.

114. According to the April 4, 2013 Samarco Board minutes, Terra provided an update on Samarco’s tailings disposal plan and “stress[ed] the related risks and the mitigation actions[.]” In response to this update, the Samarco Board “stressed the importance of continuing with the studies on alternative tailings facilities[.]” José Martins, Hélio Moreira, James Wilson, Jeffery Zweig, Steve Potter, Sérgio Consoli and Ricardo Vescovi were also present at this meeting.

115. According to the December 4, 2013 Samarco Board minutes, Terra presented “detailed information about the tailings disposal system[.]” In response to this presentation, the Samarco Board “acknowledged the progress made, stressing, however, that tailings are still a point of considerable concern, particularly regarding the future tailings storage capacity.” James Wilson, Jeffery Zweig, Hélio Cabral, Stephen Potter, Sérgio Consoli and Ricardo Vescovi were also present at this meeting.

116. According to the September 19, 2014 Samarco Board minutes for the morning meeting, Vescovi presented the “main premises and projected results of [Samarco’s] Five-Year Plan, noting the importance of the investments in tailings disposal.” In response to this presentation, the Samarco Board approved the Five-Year Plan and recommended that management “resolve the limitations for tailings disposal at dams and dumps, making that the Company’s main priority[.]” Pedro Rodrigues, Sérgio Consoli and Kleber Terra were also present at this meeting.

117. According to the December 10, 2014 Samarco Board minutes, Vescovi reported to the Samarco Board that the forecast for cumulative production of iron ore pellets had decreased by 10.7% compared to the budgeted amount for the year due to increased operating costs. In response to this report, the Samarco Board “challenged the executives to seek substantially better results in 2015, mainly considering the negative conditions forecast for the market in 2015, delivering the results promised in the budget is essential.” James Wilson, Stephen Potter, Sérgio Consoli, Margaret Beck and Kleber Terra were also present at this meeting.

118. At the same meeting, the Samarco Board stressed that, after safety, “cost reduction should be the main management focus in 2015.” With respect to tailings dams, the Samarco Board reiterated “the concern over the risk related to the tailings disposal and sanitary landfill projects, and the impacts of the amounts of capital needed on the results of the company[.]”

119. According to the April 15, 2015 Samarco Board minutes, Terra reported that production for 2015 was in line with the budget through February 2015 and that the pelletizing plant from the P4P Project had reached its planned capacity. James Wilson, Pedro Rodrigues, Stephen Potter, Sérgio Consoli, Margaret Beck, and Ricardo Vescovi were also present at this meeting.

120. At the same meeting, the Samarco Board approved the execution of a project to raise the elevation of the Fundão dam immediately. The Samarco Board also approved an additional raise of the Fundão dam’s elevation in August 2015.

2. The Operations Committee and Its Performance Management Subcommittee Also Discussed in Depth Tailing Issues

121. As indicated above, Samarco's Operations Committee was responsible for providing support to the Board of Directors on technical matters and issues related to operations, with three subcommittees: Performance Management, Capital Projects, and Technical [Support].

122. Among other duties, the Operations Committee analyzed the technical information to be sent to the Board of Directors, established specific technical recommendations, and provided recommendations to be taken by the Board of Directors.

123. According to article 2 of the Samarco Committee's Internal Regulations, the purpose of the Operations Committee is "to advise the Board of Directors . . . to ensure that the Company's activities would be conducted in a way to protect and enhance its equity and optimize long-term return on investment . . . establishing the general orientation of activities and decisions on strategic matters, in accordance with the laws, ethics and company's usual practices."

124. The Operations Committee, as well as the other Committees that assisted the Board of Directors, was composed of representatives of Samarco, Vale and BHP. According to article 4 of the Samarco Committee's Internal Regulations, the participation of at least two members of the Board of Directors and representing shareholders in each Committee is mandatory.

125. During the Class Period, Defendants Vescovi, Terra, and Souza, Samarco's executives, as well as Defendants Consoli, a BHP representative, and Potter, a Vale representative, participated in almost all Operations Committee meetings.

126. Tailings Dams issues were frequently and extensively discussed in the Operations Committee before and during the Class Period.

127. For example, during the meeting held on March 26, 2012, the members of the Operations Committee received information about the study on the local communities located downstream from the tailing dams. The Committee recommended at that time that neighboring properties should be targeted for acquisitions. At the same meeting, the Committee requested that Samarco properly classify any income related to the disposal of Vale's tailings in Samarco facilities, adjusting the current booking (cost-of-set), and reinforced the need to execute the revised tailings contract between Vale and Samarco. Participants included Defendants Consoli, Vescovi, Souza, Terra and the following representatives of Vale and BHP: Cláudio Alves (Vale's Global Director of Ferrous Materials Marketing and Sales), Paulo Bandeira (Vale's General Management for Iron Ore Planning and Development), Márcio Borrelli (Vale's Strategic Planning Manager), Luciano Sequeira (Vale's engineer and representative), Rogério Tavares Nogueira (BHP's Vice President of Iron Ore Americas), Guilherme Ferreira (BHP representative), and Evilmar Fonseca (BHP's manager of Iron Ore Operations).

128. On November 21, 2012, the Operations Committee extensively discussed Samarco's dam management model considering short, medium and long term, including its Tailings Disposal System. Participants included Defendants Consoli, Vescovi, Souza, Terra and the following representatives of Vale and BHP: Cláudio Alves (Vale's Global Director of Ferrous Marketing and Sales), Paulo Bandeira (Vale's General Management for Iron Ore Planning and Development), Márcio Borrelli (Vale's Strategic Planning Manager), Luciano Sequeira (Vale's engineer), Rogério Tavares Nogueira (BHP's Vice President of Iron Ore Americas), Guilherme Ferreira (BHP representative), and Evilmar Fonseca (BHP's manager of Iron Ore Operations).

129. According to the March 15, 2013 Operations Committee meeting minutes, the short and long term of Samarco's tailings disposal system was once again discussed. At that time, the Committee requested information related to the capacity of tailings disposal. Participants included Defendants Consoli, Steve Potter, Cabral, Vescovi, Souza, Terra, Samarco Executives Roberto Carvalho, Eduardo Bahia and Cristiano Pimenta, and the following representatives of Vale and BHP: Guilherme Ferreira (BHP representative), Maria Inês Carvalheiro (Vale's general manager of Mergers and Acquisitions), Fernando Correa (Vale's Strategy Manager), and Luciano Sequeira (Vale's engineer).

130. According to the November 13, 2013 Operations Committee meeting minutes, Maury reported on the projects necessary to strengthen the Fundão draining system, highlighting that it was the only project in the execution phase where the main functionality would not be concluded by the end of that year. It is worth noting that according to the criminal complaint, such works had not been completed by the time of the Fundão Dam collapse. Participants included Defendants Consoli, Potter, Cabral, Vescovi, Terra, Samarco executives Roberto Carvalho, Eduardo Bahia Martins Costa and Cristiano Pimenta and the following Vale representatives: Maria Inês Carvalheiro (Vale's General Manager of Mergers and Acquisitions), Cleber Santiago (responsible for managing Vale's controlled companies), and Luciano Sequeira (Vale's engineer).

131. According to the March 14, 2014 minutes, Terra presented an ITRB report showing clear signs that the internal drainage was insufficient, especially in the area of the left abutment. "Concerning the tailings disposal system critical to the business, the Committee recommended top priority and tight follow-up to deliver alternative contingency solutions." Participants included Defendants Consoli, Potter, Vescovi, Souza, Samarco Executives Roberto

Carvalho, Eduardo Bahia and Cristiano Pimenta and the following Vale representatives: Maria Inês Carvalheiro (Vale's general manager of Mergers and Acquisitions), Cleber Santiago (responsible for managing Vale's controlled companies), Luciano Sequeira (Vale's engineer), Márcio Borrelli (Vale's Strategic Planning Manager), and Paulo Figueiredo (Vale's Financial Specialist).

132. On August 7, 2014, Samarco's Subcommittee for Performance Management, which is directly linked to the Operations Committee, discussed the ITRB report issued in July 2014. According to the presentation made by Germano Lopes (Samarco's General Manager of Soil Science), the members of the Subcommittee acknowledged ITRB's recommendation to install piezometers on the right abutment of Fundão dam since the pressure identified was 40% higher than expected. It was also pointed out in the presentation that the slimes disposal volume was also higher than expected. The members of the Subcommittee included Defendants Consoli and Terra, the following representatives of BHP and Vale: Guilherme Ferreira (BHP representative), André Cardoso (BHP's Finance Manager), Luciano Sequeira (Vale's engineer) and other Samarco employees.

133. Soon thereafter, according to the August 19, 2014 Operations Committee meeting minutes, Defendant Terra updated the members of the Committee on the tailings disposal system and ITRB's recommendations. Participants included Defendants Consoli, Potter, Vescovi, Souza, Samarco Executives Roberto Carvalho, Eduardo Bahia and Cristiano Pimenta, and the following Vale representatives: Maria Inês Carvalheiro (Vale's general manager of Mergers and Acquisitions), Cleber Santiago (responsible for managing Vale's controlled companies), Luciano Sequeira (Vale's engineer), Márcio Borrelli (Vale's Strategic Planning Manager), and Paulo Figueiredo (Vale's Financial Specialist).

134. According to the March 18, 2015 Operations Committee meeting minutes, in addition to all the problems related to the Fundão Dam that had been reported so far, Defendant Souza presented to the members of the Committee the project entitled “Raising of Germano and Fundão Dams – elevation 940m”. The execution of the project was thereafter submitted and approved by Samarco’s Board of Directors. Participants included Defendants Consoli, Potter, Vescovi, Terra, Samarco Executives Roberto Carvalho, Eduardo Bahia and Cristiano Pimenta, and the following Vale representatives: Maria Inês Carvalheiro (Vale’s general manager of Mergers and Acquisitions), Luciano Sequeira (Vale’s engineer), and Paulo Figueiredo (Vale’s Financial Specialist).

3. Vale’s Contract with Samarco Allowed it to Dump Its Waste Into the Fundão Dam But This Significant Fact Was Hidden From Investors and the Brazilian Supervisory Authorities

135. Samarco was not only contending with the substantial increase in tailings caused by the P4P Project, but it also was filling the Fundão dam with waste from Vale’s nearby Alegria mine. On December 21, 2015, *The Wall Street Journal* reported that Brazilian prosecutors indicated they had records from Brazil’s federal mining agency showing that tailings from Vale accounted for up to 27% of the tailings volumes of the Fundão dam.

136. Multiple Samarco employees and contractors testified that Vale dumped tailings from its mines into the Fundão dam. Even Terra, who regularly provided updates on the tailings dams to the Samarco Board, testified that: he “was aware that Vale S.A. deposited tailings at the Fundão Dam”; he “was informed of this fact by mid-2012”; and he was aware of the contractual relationship between Vale and Samarco providing for this arrangement. In sworn testimony, many other former Samarco employees and directors (Germano Silva Lopes; Paulo Sérgio Machado Ribeiro Filho; João Pedro da Silva; Rafael Cristiano Gomes; Euzimar Augusto da Rocha Rosado; Rodrigues Silva; Wagner Milagres Alves; Rodrigo Dutra Amaral; and

Wanderson Silvério Silva) confirm that Vale dumped tailings from its mines into the Fundão dam. Indeed, João Pedro da Silva, a master engineer in Samarco's planning and sustainability department, testified that the Fundão dam was built in part to receive tailings from Vale's Alegria plant. Moreover, Pimenta de Avila, a consultant for Samarco who was the original designer of the Fundão dam, testified that he "was contracted from the beginning to design the Fundão dam to receive tailings from Samarco's Germano Complex and slurry from Vale S.A.'s Alegria Complex[.]"

137. Wagner Alves, Samarco's General Manager for Mining Operations, whose responsibilities included supervising and managing dam operations and maintenance, testified that waste from Vale mines came to the Fundão dam every day through pipelines linking Vale's Alegria mine to the dam. He also testified that Vale was responsible for "all of the installation, maintenance and monitoring of the pipelines transporting wastes from Vale S/A to the Fundão dam." Paulo Sergio Machado Ribeiro Filho, a Samarco environmental analyst, testified that "only after the dam ruptured did he see the pipes that he was informed were used to direct Vale's tailings to the dam."

138. Mr. Alves testified that no quality control was done on the volume of waste that Vale discharged into the dam, only verification of the total volume of the dam. He believes that Samarco **did not** have a specific environmental permit to receive waste from Vale, and could not explain why Samarco did not include information about Vale's discharge of wastes into the Fundão dam in the environmental performance report submitted in connection with the request to renew the dam's operating license. Rodrigo Amaral, who was responsible for coordinating environmental licensing at Samarco before joining Vale as its General Manager for the

Environment, confirmed that there was no specific environmental license for Vale to dump its tailings into the Fundão dam.

139. The contract that allowed Vale to use the Fundão dam, entitled “Agreement to Use Tailings Dam,” was initially entered into between Samarco and SAMITRI in 1989. The purpose of the agreement was to allow SAMITRI to use Samarco’s tailings dams when disposing of tailings from the nearby Alegria mine.

140. Specifically, the agreement required SAMITRI to construct at its own cost a disposal system to transport tailings to Samarco’s dams. The contract also required the implementation of mechanisms to calculate and record the quantity of material placed in the dams, and for Samarco and SAMITRI to produce a joint report annually recording the quantity of such tailings dumped in the prior year.

141. Furthermore, the contract established hourly and monthly limits on the volume and weight of materials SAMITRI could dispose of in Samarco’s tailings dams; provided that any agreement to permanently raise those limits by more than 10% must be set forth in a written addendum; and required SAMITRI to “share in the maintenance expenses of the current dam and construction and maintenance of new dams, as well as any environmental costs derived from the use of the SAMARCO dams, in proportion to such degree of utilization as shall occur[.]”

142. In 2000, when Vale acquired SAMITRI, it also acquired SAMITRI’s rights under the contract.

143. *Vale was obligated contractually to construct and maintain the Fundão dam.* The contract Samarco provided to Brazilian prosecutors as the basis for Vale’s right to dump tailings in the Fundão dam establishes Vale’s contractual obligations. The agreement requires Vale to construct at its own cost a tailings disposal system to transport tailings to Samarco’s

dams. The contract also requires the system to have devices for calculating and recording the quantities of material disposed of in the dams, and requires Vale and Samarco to produce a joint report annually recording the quantity of tailings that Vale dumped in the prior year. It also sets hourly and monthly limits on the volume and weight of materials to be dumped in the dams, and provides that any agreement to permanently raise those limits by more than 10% must be set forth in a written addendum. According to figures released by Vale and posted in a “FAQ” section on its website after the collapse, Vale dumped more than one million tons of waste in the Fundão Dam in 2014, 36% more than the contract allowed.

144. The contract obligates Vale to share in the maintenance expenses of existing dams and the construction and maintenance of any new dams:

SAMITRI [Vale] shall share in the maintenance expenses of the current dam and construction and maintenance of new dams, as well as any environmental costs derived from the use of the SAMARCO dams, in proportion to such degree of utilization as shall occur.

145. Because the Fundão Dam did not exist when Vale assumed SAMITRI’s obligations under the contract, Vale had the obligation to share in the maintenance and construction of the Fundão dam.

146. A revised version of the contract between Samarco and Vale was discussed at Samarco’s March 26, 2012 Operations Committee Meeting, who was attended by Defendants Consoli, Vescovi, Souza, Terra and the following representatives of Vale and BHP: Cláudio Alves (Vale’s Global Director of Ferrous Materials Marketing and Sales), Paulo Bandeira (Vale’s General Management for Iron Ore Planning and Development), Márcio Borrelli (Vale’s Strategic Planning Manager), Luciano Sequeira (Vale’s engineer and representative), Rogério Tavares Nogueira (BHP’s Vice President of Iron Ore Americas), Guilherme Ferreira (BHP representative), and Evilmar Fonseca (BHP’s manager of Iron Ore Operations).

147. Vale's use of the Fundão dam to dump millions of tons of its own tailings was never disclosed to investors before the dam collapsed. Nor was it disclosed to the Brazilian regulatory bodies responsible for granting environmental licenses and/or overseeing mining operations. According to the criminal complaint filed by the Brazilian Federal Prosecutor's office, DNPM only learned on November 27, 2015 (after the collapse of the dam) that tailings from Vale's plant were being disposed at the Fundão dam. It was found that Samarco and Vale failed to report at any time to the Brazilian authorities—either at the time Samarco was seeking an environmental license from SEMAD or at the time it submitted the Annual Reports of Mining and Economic Utilization Plans to DNPM—that Vale was disposing tailings from its Alegria plant into the Fundão dam.

148. According to a criminal complaint filed by the Brazilian Federal Prosecutor's office, between 2008 and 2015, Vale disposed in Dike 2 of the Fundão Dam of SFR 5,187,610 m³ of tailings. On average, annually Vale disposed of 648,451 m³ tailings in the Fundão dam.

149. According to a report prepared by the technical department of the Brazilian Federal Police, Vale's tailings deposits greatly influenced the rise of the reservoir level, contributing about 27% of all tailings deposited into the Fundão dam. Based on a simulation, the Report also pointed out that, *without Vale's contribution, the slimes would not have contaminated the sandy tailings or resulted in the failure to maintain the 200 m minimum beach requirement.*¹

¹ As explained in a report commissioned by the corporate defendants on the immediate causes of the failure of the Fundão dam, "[a] requirement common to both the original and revised designs [of the dam] was that the sands be free-draining. To ensure that low-permeability slimes would not be deposited where they could impede this drainage, water containing the slimes had to be restricted from the area of sand deposition. To do so, a 200 m minimum beach width had been

150. Justiça Global, a non-governmental human rights organization, published a report after the collapse revealing that all of the mines in Vale's Mariana complex directed all or part of their tailings to the three large dams at Samarco's Germano complex, including the Fundão dam.

151. Vale admitted after the collapse that production at its Mariana mining hub had decreased almost 40% as a result of the disaster, confirming the Fundão dam's operational importance to Vale's own mining operations. Analysts confirmed its economic importance, estimating that the disruption could lead to a \$1.25 billion decrease in Vale's revenues and a \$540 million decrease in EBITDA.

152. At the end of 2015, the Brazilian Federal Judge, Marcelo Aguiar Machado, in a decision that was affirmed by the Brazilian Federal Court of Appeals, ruled that Vale must be considered a "direct pollutant" and, therefore, directly responsible for all damages caused by the failure of the Fundão dam due to its use of the dam. BHP was also found responsible as an indirect polluter.

E. The Fundão Dam's History of Serious Problems

153. Pimenta de Avila designed the Fundão dam in 2006 and 2007. According to his testimony, ever since the Fundão dam was constructed in 2008 and inaugurated in 2009, it was plagued with serious problems, as further recognized by Samarco in the technical Report entitled "Report on the Immediate Causes of the Failure of the Fundão Dam", prepared at the request of Samarco, Vale and BHP Brasil.

154. For example, in 2009, Dike 1 of the Fundão Dam experienced severe drainage problems. Specifically, rather than moving the water downstream away from the tailings, as it

specified in the original 2007 Operations Manual, a provision retained in the 2011 and 2012 versions."

was supposed to do, the bottom drain damned the water which caused excessive pressure in the embankment near the Fundão dam's foundation. A subsequent investigation revealed that faulty construction had caused the drain to become obstructed. To rectify the problem, the original conceptual design was adjusted and a new design, with an alternative method for draining water, required approval. Several Samarco employees responsible for the Fundão dam's operation confirmed the existence of this problem, including: (i) Lopes, the general manager of structure projects at Samarco, and (ii) Rodrigues Silva, Samarco's manager of soil science and hydrogeology. This problem was also acknowledged by Samarco in its "Report on the Immediate Causes of the Failure of the Fundão Dam".

155. Pimenta de Avila testified that the Samarco Board, including the BHP and Vale executives on the Samarco Board at that time, were informed of this problem and authorized the design change. He further testified that these changes and corrections were implemented between 2009 and 2010. Moreover, as a result of Samarco's uncertainty about the changes and corrections, Vale's dam experts team, appointed by Samarco's Board of Directors in its 77th Meeting, revised and approved such changes and corrections on behalf of Samarco.

156. Also at this time, Samarco debated the possibility of pursuing indemnity from the construction company responsible for building the Fundão dam. However, Samarco was advised by its counsel not to do so, since all changes were not performed by the construction company, but rather by Samarco, despite Pimenta de Avila's original project.

157. Shortly thereafter, in 2010, according to testimony from Pimenta de Avila, Lopes and Rodrigues Silva, a deformation or "piping" was noted in the Fundão dam's main gallery spillway on the right shoulder of the dam. Spillways are passages or structures through which excess water in a dam is released. Piping is a serious problem that occurs when water exiting a

tailings impoundment picks up soil particles and moves them out of a dam's foundation or embankment. The continued removal of soil particles causes channels or "pipes" to develop in the dam's walls or foundation. If these channels or pipes become big enough to connect to the free-standing water in the reservoir, large flows can develop, leading to a complete dam failure. According to Pimenta de Avila, this problem was caused by an excessive decant within the dam's main spillway, which caused tailings to flood through a concrete joint at the point of the greatest decanting.

158. In 2012, a similar problem occurred in the Fundão dam's secondary gallery, located on the left side of the dam. Pimenta de Avila and Lopes both testified that a sinkhole occurred in the tailings beach, caused by a break in a concrete joint in the secondary gallery. Pimenta de Avila testified that an investigation ultimately showed that the design change necessitated by the initial drainage problem in 2009, and a misalignment between the original construction and the changed design, caused these additional problems. A specialized company brought in to examine the problem, Noh Engenharia, proposed a solution that involved reinforcing the galleries. But because that solution would have limited the elevation that the Fundão dam could reach with tailings waste, thereby reducing its capacity, this solution was not implemented. Instead, the galleries were plugged and deactivated so that the Fundão dam could be raised yet again. Lopes testified that by plugging the main and secondary galleries, "it became necessary to build a new overflow system."

159. A technical Report entitled "Report on the Immediate Causes of the Failure of the Fundão Dam", stated that "it was discovered from structural analyses that the Secondary Gallery could not support tailings higher than El. 845 m, some 10 m lower than the tailings already were at that time."

160. According to a September 2011 Technical Report for Samarco regarding the Fundão dam that was authored by Pimenta de Avila, Samarco wanted to expand the dam by extending it to a valley adjacent to a waste dump at a neighboring Vale mine. Pimenta de Avila explained in his report that, in order to safely expand the Fundão dam in the manner requested, the axis and geometry of the dam would have to be modified. He also expressed the concern that the proposed expansion would interfere with drainage at the adjacent Vale mine, and concluded that surface flows from the adjacent Vale waste dump could negatively impact the Fundão dam.

161. Notwithstanding Pimenta de Avila's concerns, the expansion went forward and the axis and geometry of the Fundão dam were changed significantly, both to implement the requested expansion and to solve the ongoing drainage problems plaguing the dam. Pimenta de Avila, whose contract was not renewed when it expired in 2012, played no role in the change and thus could not have signed off on the modifications, but was engaged as a consultant for design review to Samarco in October 2013 and thereafter ascertained that these changes had occurred. Aerial photos of the Fundão dam from 2011 and 2013, used by Brazilian prosecutors in certain depositions of Samarco employees, show the significant change in its geometry during this time period:



162. Terra confirmed that he “was informed at the end of the year 2012, that there would be a change made in the Fundão Dam’s axis (retreat)[,]” that he “was informed that the

retreat would be necessary due to a problem in the secondary gallery[.]” and that because there was no “budgetary autonomy for plugging the secondary gallery . . . it was necessary to have pertinent authorization from other hierarchical bodies due to the amount involved[.]” Terra further confirmed that, in response to these drainage problems, the “reduction of placement of tailings at the Fundão Dam was not presented to [Terra] as an alternative to proceeding with the change to the dam’s axis[.]” This retreat was described as a setback in the “Report on the Immediate Causes of the Failure of the Fundão Dam”.

163. According to Alves, another part of the solution to the ongoing “piping” and drainage problems was to build a recess in the Fundão dam’s left abutment, which was in the process of being raised. Alves was employed by BHP from 2003 to September 2012 and then began working for Samarco in October 2012. By October 2014, Alves had become the general manager for Samarco, a position that included, among other responsibilities, monitoring and inspecting tailings dams. Alves admitted that no license was obtained for construction of the recess, and that there was no provision for the recess in the environmental permit for raising the Fundão dam.

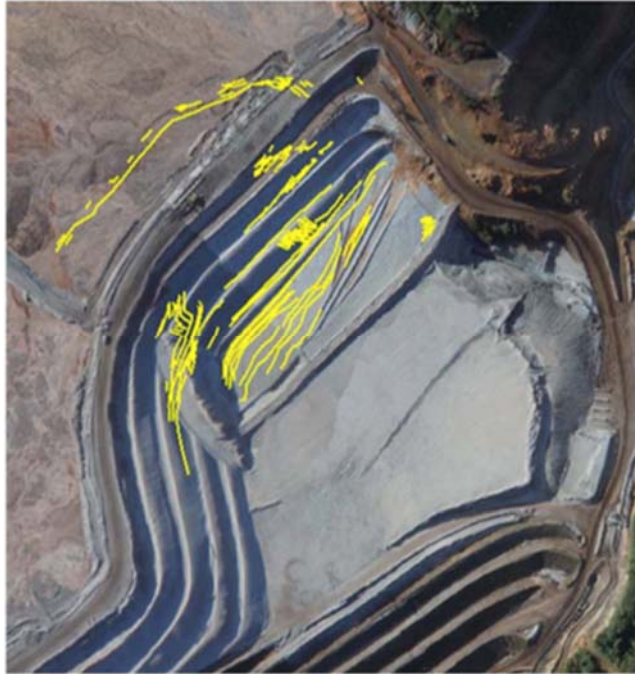
164. When shown satellite images of the Fundão dam’s modified axis and geometry, Pimenta de Avila testified that the “modified condition of the Dam’s axis requires strict monitoring of the water level conditions within the tailings in order to check for liquefaction risk conditions[.]” He also testified that the original operating manual recommended that changes not be made to the Fundão dam’s geometry for safety reasons, but that if changes to the geometry were made, then the stability analysis should be revised. Again, that recommendation was not followed, as the Fundão dam’s geometry was changed without revising the stability analysis. As per the “Report on the Immediate Causes of the Failure of the Fundão Dam”, Samarco had

knowledge of the strict requirement of monitoring the water level conditions and that the review of the stability analysis, that should have been made, was pending.

165. While the galleries were plugged, dam rising had continued, with seeps that began to appear at the left abutment as early as June 26, 2012, at elevation 845 m. Seepage, saturation, and cracking also began appearing at several locations at the left abutment during 2013. According to the Technical Report on the Immediate Causes of the Failure of the Fundão Dam, one incident occurred in March 2013, at elevation 855 m, followed by another seep in June 2013 at elevation 855 m. A third seep appeared on November 15, 2013, at elevation 860 m. On December 26, 2013, seepage occurred at elevation 860 m, and there was cracking on the left abutment crest at elevation 875 m.

166. Indeed, Lopes testified that the dam continued to experience serious problems. For example, there were water upsurges in the embankment near the left shoulder of the Fundão dam in 2013. Upsurges can cause significant saturation in the embankments, which in turn can lead to liquefaction and collapse.

167. Cracks continued in 2014. For example, on August 27, 2014, a series of extensive cracks was discovered that extended behind the dam crest, emerged at the toe, and reached most of the slope. The cracks were accompanied by shallow saturation. The cracks are highlighted on the aerial image reproduced from the Report on the Immediate Causes of the Failure of the Fundão dam:



168. In September 2014, fourteen months before the collapse, Pimenta de Avila, in his role as a part-time consultant to Samarco, performed six inspections of the Fundão dam and identified several serious risks. The most significant risk involved the beginning of a break in one of the Fundão dam’s retreat dikes. Pimenta de Avila identified several extended cracks running parallel to the crest of the dike, as well as signs of movement at the foot of the slope. As he later testified, “the most relevant risk situation . . . on the September 4, 2014 visit” was “the beginning of a break in the retreat dike, evidenced by the occurrence of extended cracks parallel to the crest of this dike combined with signs of movement at the foot of the slope of this retreat[.]” He also identified liquefaction as a likely cause of these cracks, testifying further that “the geometry of the cracks characterized a vast area with movement typical of sliding which very probably would have been caused by the occurrence of liquefaction involving foundation tailings from the retreat dikes[.]”

169. As Pimenta de Avila later told *The Wall Street Journal*, in an article dated January 17, 2016, he informed Samarco engineers, Francisco Almeida, Wanderson Silvério Silva and

Anelisa Vasconcelos of his belief that these cracks were the beginning of a rupture, while inspecting the Fundão dam on September 4, 2014. According to his testimony, Pimenta de Avila made three recommendations to protect against liquefaction: (i) installing a buttress or reinforcements designed to take into account the likely liquefaction of the dike's foundation; (ii) installing piezometers along the wall at least ten meters below the foundation to monitor water pressure and saturation; and (iii) daily monitoring of the piezometers' readings and, if the readings indicated saturation in the foundation, drilling pumping wells to reduce the saturation level to guarantee the Fundão dam's stability.

170. According to his testimony, Pimenta de Avila visited the Fundão dam again in December 2014 and recommended additional stability tests, using stricter safety coefficients. When he later inquired about the results of the recommended stability tests, he was told the results had been lost because the "computer's hard drive had burned up[.]" In response, he reemphasized the importance of performing the tests, and urged that the tests be made a priority. He testified that he "never received any feedback or request for clarifications about his reports." He also testified that he reviewed the consulting reports prepared by the company responsible for the stability reports for the Fundão dam (a Brazilian company called VogBR) and "verified that his recommendations produced in 2014 were not considered by any consulting company." He also noted that "the results for the piezometers, the installation of which had been recommended in the retreat area, were not found in the reports produced by [the consultant], nor were these results and the risks inherent to them taken into consideration when preparing the document that attested to the stability of the Fundão dam[.]"

171. There was no need for Pimenta de Avila to inform anyone at Samarco of cracks in the Fundão dam in September 2014 or thereafter, because Samarco executives already knew.

For example, according to Brazilian newspaper *Estadão*, the federal police investigation report uncovered Samarco emails, including one on August 29, 2014, at 3:56 p.m., in which Terra advised Vescovi that “some cracks in the massive where the course was deviated appeared at Fundão.” The implication of this communication was that cracks had appeared in 2014, where the geometry of the Fundão dam had been changed earlier (in 2012). This problem was also acknowledged by Samarco in its “Report on the Immediate Causes of the Failure of the Fundão Dam”.

F. Defendants Ignored Repeated Warnings About the Fundão Dam

172. At Samarco’s 110th Board of Directors meeting held on April 4, 2013, Terra presented an update on the tailings disposal plan, highlighting the risks and mitigation actions, and an assessment of Samarco’s mineral resources and mineral reserves, showing that both increased 8.1 billion tons and 3.0 billion tons, respectively. Participants included José Carlos Martins (chairman of the Board), Hélio Cabral Moreira (permanent member of the Board), James Wilson (permanent member of the Board), Jeffery Mark Zweig (alternate member of the Board), Stephen Potter (alternate member of the Board), Sérgio Consoli Fernandes (alternate member of the Board), Maria Inês Carvalheiro (Vale’s general manager, invited as a guest), Uvashni Raman (BHP Financial Vice-President, invited as a guest), Vescovi, and other members of the Samarco Executive Board. At the meeting, the Board reinforced the importance of alternative tailings facilities, but advised the executives to “increase [the] sales in the second quarter to take advantage of the current favorable market conditions.”

173. A Failure Analysis Report issued by Samarco on July 8, 2013, identified slimes being improperly discharged in Dike 1, which at the time had a height of 863.5 m. According to the report, slime leaks were identified in Samarco’s iron ore beneficiation plant. These leaks

were directed to containment bays and, after that, pumped into the Dike 1 of Fundão dam, improperly being mixed with the sandy tailings.

174. At Samarco's 114th Board of Directors meeting held on December 4, 2013, whose participants included James John Wilson, Jeffery Mark Zweig, Hélio Cabral Moreira, Stephen Potter, Sérgio Consoli Fernandes, Vescovi and Terra, Terra presented measures taken to achieve 21.15 million tons of pellets in that year and the successful initiatives resulting in significant gains in production. The Board of Directors recommended that Samarco strive for maximum efficiency in production by eliminating bottlenecks. Terra also presented "detailed information on the tailings disposal system." The Board of Directors emphasized that tailings are still a matter of major concern, particularly with respect to future tailings storage capacity. The Board also discussed the Dike 1 axis setback in the left abutment and the existence of minimum beaches separating slimes and sandy tailings with less than 200 meters in width, in complete contravention of the initial design made by Pimenta de Ávila and of the operations manual of the dam.² There were indeed reasons for great concern regarding the tailings system, as stated in the minutes of the Board. In August of 2013, seepage in the 855 m elevation along the Dike 1 left abutment was found. In November 2013, a new seepage was identified in the same abutment, but at the 860 m level. By that time, Samarco had already concluded that the drainage system of the Fundão dam was not functioning properly. Nevertheless, Samarco remained fixated on production gains and cost cutting. At this meeting, the 2014 budget was approved with

² According to the criminal complaint filed by the Brazilian federal prosecutor's office, between 2011 and 2012, there were numerous instances of noncompliance with the minimum beach width requirement. Out of 17 readings that were analyzed, the majority showed violations of this safety measure. Violations of this requirement were also prevalent during the period from July 2013 until the dam collapsed.

recommendations for “reducing labor costs, mitigating historical growth in contractor costs, tightening productivity projects and adjusting capital.”

175. Despite referring to the tailing dams as a matter of major concern at the 114th meeting of Samarco’s Board of Directors, almost no information of significance was recorded with respect to tailings in the subsequent minutes of the 115th Board of Directors meeting held on April 4, 2014, which instead focused on cost cutting and the distribution of dividends.

176. Also in 2013, as the P4P Project was being implemented and production (and the corresponding tailings waste) was dramatically increasing, the decision was made to expand the Fundão dam rather than invest the capital necessary to build a new dam. In connection with the application to expand the Fundão dam and “revalidate” the license to operate it, the Minas Gerais State Prosecutor’s Office retained the Instituto Pristino, a not-for-profit environmental and geotechnical modelling institute affiliated with the University of Minas Gerais, to study the Fundão dam and prepare a report on its condition and whether the license should be renewed.

177. The Pristino Report, which is dated October 21, 2013, was published on the website of the State of Minas Gerais’ environmental regulator, Supram, shortly after its completion. The four technicians who prepared the Pristino Report warned of serious risks at the Fundão dam, and recommended that the license not be renewed unless a number of conditions were met.

178. For example, the Pristino Report warned that the Fundão dam’s proximity to an adjacent Vale tailings pond posed serious risks that rising water levels, resulting from the natural flow of surface water, could cause several collapses in the Fundão dam’s walls, creating a massive flow of waste. The Pristino Report concluded that the structures never should have been adjacent to each other because of their different physical characteristics. The Pristino Report

stated that these design defects had been noted in previous technical reports, and should have been included in the application for renewal. These were the same concerns that Pimenta de Avila noted in his September 2011 Technical Report, discussed above. Like Pimenta de Avila's earlier report, the Pristino Report also recommended that studies on the possible impact of contact between the structures be undertaken.

179. In addition, the Pristino Report recommended that the following conditions be placed on renewing the license: (i) more frequent (less than one year between tests) geotechnical and structural testing and monitoring of the Fundão dam and adjacent dikes; (ii) the creation and presentation of a contingency plan for hazards or accidents that may occur, including evidence of the effectiveness of the contingency plan; and (iii) performance of a break analysis of the Fundão dam, which was supposed to have been delivered to regulators six years earlier and which, the Pristino Report noted, was of "extreme importance to ensure the security and integrity of the environment."

180. Ultimately, these conditions were not imposed on renewing the license and the recommended steps were not taken, causing the Minas Gerais State Prosecutor to abstain from voting to approve renewal of the license. Nonetheless, Supram renewed Samarco's license for the Fundão dam on October 29, 2013.

181. At its 11/19/15 annual general meeting, BHP Billiton's Chairman of the Board Jac Nasser admitted that BHP knew about the Pristino Report in 2013. Specifically, at the 11/19/15 meeting, Greenpeace representative Dr. Casule used proxies to question Nasser and Mackenzie directly over the collapse. As reported in a November 23, 2015 article by SNL Metals & Mining Daily, the following exchange took place between Nasser and Casule:

Questions were raised as to why the Samarco mine was allowed to remain in operation after safety concerns were flagged in the Instituto Pristino report.

“On behalf of all of those affected and of the people of Brazil, I ask since BHP subsidiary Samarco was alerted to the danger posed by this dam in 2013, why did Samarco allow operations to proceed?” Casule questioned.

However, Nasser disputed Casule’s argument that had the safety concerns raised in the report been addressed, BHP Billiton would have been able to prevent the most recent tragedy at the Samarco mine.

“I don’t agree with you on the Instituto Pristino report that came out in 2013,” he said. “I don’t think that issue is relevant here. We’ve looked at it, we looked at it back then, we’ve looked at it now – it’s an interesting and unfortunate circumstance that happened, but not related to this.”

182. Nasser’s admission—“we looked at [the Pristino Report] back then”—is uncontroverted proof that BHP, up to the highest levels of the Board, knew about, and chose to disregard, the significant warnings concerning the Fundão dam set forth therein.

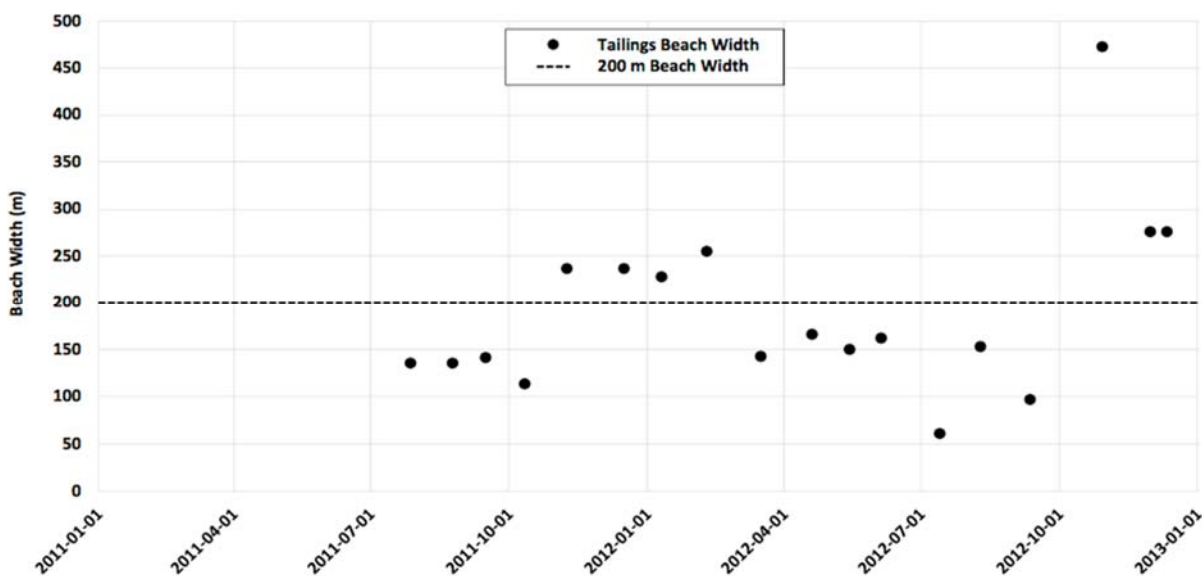
G. Numerous Reports of Cracks in the Dam and Other Alarming Signs of Potential Rupture

183. On December 26, 2013, Samarco identified and recorded the formation of a crack at the 872 meter elevation level next to the left abutment. The crack had an opening of approximately 10 mm and a total length of 60 m. It was also found that the base of the slope next to the left abutment was very soggy.

184. A report prepared by ITRB in January 2014, signed by Angela Küpper, Paulo Abraão, Rui Mori, Waldyr Lopes and Vinod Garga, included the finding that the Fundão dam was already showing clear signs that the internal drainage was insufficient, especially in the area of the left abutment: “This result seems to indicate the ineffectiveness of the internal drainage and its origin and current limitation is caused by the catchment basin formed in front of the starter dam and below the horizontal blanket of the 825 m. elevation.” The report was presented in the Operations Committee meeting held on March 14th, 2014, which was attended by the following individuals: BHP representative Sérgio Fernandes (BHP’s Director of Iron Ore in the Americas and Samarco’s alternate member of the Board), Vale representatives Steve Potter

(Director of the Vale Global Strategic Planning Department and an alternate member of Samarco's Board), Maria Ines Carvalheiro (Vale's General Manager of Merges and Acquisitions and a representative of Samarco's Governance), Paulo Figueiredo (Vale's Financial Specialist), Cléber Santiago (responsible for managing Vale's controlled companies), Márcio Borrelli (Vale's Strategic Planning Manager), Luciano Torres Sequeira (Vale's engineer and representative at Samarco's Governance Committee); and Samarco representatives Vescovi (CEO) and Terra (Operations Officer).

185. As of February 2014, the beach in the right abutment was reduced to an 80 m width, significantly below the 200 m minimum beach requirement between the two dikes. Violations of the 200 m minimum beach requirement in the Fundão dam occurred continuously throughout and leading through the Class Period, as reflected in the chart reproduced from the Report on the Immediate Causes of the Failure of the Fundão Dam:



186. On July 18, 2014, a seepage was identified in the slope of Dike 1 in the right abutment at levels 850 m and 855 m, where an overflow channel was previously installed, facilitating the waterway through the soil.

187. On July 22, 2014, after analyzing piezometers' data, ITRB prepared a report, signed by Rui T. Mori, Vinod Garga and Waldyr Lopes de Oliveira Filho, recommending the construction of deep horizontal drains in the right abutment in order to lower the water table level and its pore pressure. ITRB demanded special care in this construction to avoid piping.

188. On or around August 31, 2014, a Samarco inspection team identified several cracks across the crest of the setback embankment and another set parallel to the crest, as well as signs of compression also parallel to the foot of the setback slope. These cracks reflected a beginning of sliding movement at the setback embankment.

189. The next warning came in September 2014, when Pimenta de Avila performed six inspections of the Fundão dam, as discussed above. Pimenta de Avila memorialized the results of three of these inspections in reports, and concluded that liquefaction was a likely cause of cracks in the wall of the dam. Pimenta identified slippage movement in the embankment of the axis setback in the left abutment of Dike 1. As Pimenta de Avila later related, as reported in an article dated February 28, 2016 by the *Australian Broadcasting Corporation*, the collapse of the Fundão dam could have been prevented. He further stated that “[i]f the observations show that the water level is rising, they have to drill wells and pump out to lower the water level. With that condition, I am convinced you would not have liquefaction there.”

190. Testimony from Souza, the Bento Rodrigues resident who worked for a contractor at the Fundão dam in 2014, corroborates Pimenta de Avila's testimony about cracks in the Fundão dam at that time. According to Souza's testimony, he saw a crack in a “corner” of the

dam in 2014 out of which “water was flowing.” He further testified that “everybody knew that the crack was there[.]”

191. Around this time, in the section of the setback axis, there were already at least 5 elevations of the embankment structure, totaling an elevation of 25 m, between el. 860 m and 885 m. At a November 2014 meeting between Samarco and ITRB, ITRB recommended that the [gap] should not exceed 20 m and repeated its prior recommendation that the axis be fixed:

This area must be filled as quickly as possible to return the axis to its design position. The required volume is approximately 2 Mm³ and can be filled with cyclone material and/or dry tailing. Samarco estimates that it will take 1 year to fill this area. The Board recommends that all efforts are made on priority basis to complete this work.

For the near future, operations to fill the area and continue the tailings disposal should ensure that the displacement of the displaced axis is less than 20 m and that a minimum beach of 200 m is observed.

192. ITRB also identified insufficient internal drainage at the Fundão dam, causing saturation in the Fundão’s downstream slope, with a risk of rupture.

193. At a meeting between Samarco and ITRB held in December 2014, Samarco opposed ITRB’s recommendations. The company decided to postpone returning the Fundão axis to its original position until the end of the construction of the drainage blanket in the area of grota da Vale, which was needed in order to raise the dam to an elevation of 940 m.

194. According to a deposition given by Pimenta de Avila to the Brazilian Federal Prosecutor’s Office, in December 2014, he conducted another inspection in the area of the setback axis and again, among other recommendations, told Samarco that the axis should be returned to its original position. Pimenta de Avila also testified that Samarco did not invite him to discuss with ITRB the significant findings from his September 2014 report, which found static liquefaction, the precursor to a dam rupture. According to the criminal complaint filed by the

Brazilian Federal Prosecutor's Office, the ITRB members confirmed that Samarco never showed them the inspection report prepared by Mr. Pimenta.

195. On January 30, 2015, another seepage was identified in the right abutment, this time in the slope embankment located at elevation 855 m and elevation 860 m.

196. At the time the Fundão Dike 1 failed, the crest of the embankment had reached the height of 898 m, *i.e.*, a 13-meter increase since November 2014, in direct contravention to ITRB's recommendation. Instead of returning the axis to its original position, as recommended by ITRB and Pimenta, the Defendants maintained and elevated the axis setback, increasing the risk that the Fundão dam would collapse.

197. According to the *Australian Broadcasting Corporation*, Brazilian state police believe one cause of the Fundão dam collapse was Samarco's ramped-up production, conducted via the P4P Project, in an effort to offset plunging iron ore prices. The same article quotes Brazilian state prosecutor Pinto as stating: "A dam doesn't break by chance . . . Instead of planning a new dam, with a new structure, [Samarco] looked for a patchwork solution."

198. The conclusion that the P4P Project increased production at the expense of safety is corroborated by other media reports. According to Brazilian newspaper *Jornal ES Hoje*, while the P4P Project was being implemented, *Samarco decreased its budget for geotechnical areas up to 29%*. According to Moura, "[t]his was the area responsible for maintenance of the dam, *i.e.*, the mining company produced more, and instead of monitoring more, it fired part of the technical team." Moura further stated that Samarco's plans for 2016 called for reducing expenses again by up to 38%, and that Samarco had authorization to expand the Fundão dam even higher, up to 940 meters.

199. According to *The Wall Street Journal*, Brazilian federal prosecutor Sampaio learned that between 2012 and 2015, when the P4P Project was being implemented and began fully operating, the volume of tailings at the Fundão dam grew from 5 million cubic meters to 55 million cubic meters, ***an increase of approximately 1100%***. Yet, according to the *Australian Broadcasting Company*, Brazilian police investigating the collapse discovered that, while the volume of waste being pumped into the Fundão dam increased in 2014 and 2015, the volume of water drained from the dam actually decreased. According to a February 25, 2016 article from the *Australian Financial Review*, a decrease in water drained from a tailings dam is problematic because “[i]f the tailings have not fully dried and settled before being introduced to large volumes of water then dam integrity could be threatened because the volume of tailings saturated water becomes unsustainable.”

200. Another warning came from the piezometers that Samarco had bored into the Fundão dam’s walls to measure the water pressure and saturation of the soils that comprised the walls. As explained above, when soil walls like those at the Fundão dam become saturated, they lose their ability to withstand dynamic or static stresses and the risk of the wall liquefying and collapsing increases dramatically. According to a November 24, 2015 article in *The Wall Street Journal*, Sampaio said that several of the 50 piezometers in the Fundão dam’s walls indicated “emergency” levels of pressure and stress before the Fundão dam collapsed.

201. Former BHP employee and current Samarco employee Alves testified that one of the piezometers “***continuously indicated an emergency situation in 2014 and 2015[.]***” Alves further testified that the data from the piezometers was collected weekly, not daily as Pimenta de Avila urged as part of his recommendations made in connection with his September 4, 2014, review of the Fundão dam.

202. These warning signs, which accumulated over a number of years, were knowingly disregarded or outright rejected by Defendants.

H. Additional Instances of Noncompliance During the Class Period

(i) Noncompliance with the Operations Manual

203. In 2007, Pimenta de Avila Consultoria issued the first Operations Manual for the Fundão Tailings System. Pimenta de Avila Consultoria prepared a new Operations Manual in 2012, whose declared purpose was “to establish the procedures for operation, maintenance, monitoring and safety inspections for the Fundão Tailing System,” focusing on the following objectives: “permanent stability of the structure over time; proper disposal of tailings and water management, as provided for in the project; [and] compliance with the quality standards established by SAMARCO and by the regulatory and licensing bodies of the operating and safety conditions of the structure components.” According to the 2012 Manual, “every two years or whenever there are changes in the characteristics of the dam and/or operating conditions, the manual should be reviewed for constant improvement.”

204. The 2012 Manual was not updated before the dam’s collapse despite, for example, the passage of time and the significant changes to the dam’s characteristics, including successive alterations to its height and the creation of a setback in the left abutment, which was not contemplated at the time the 2012 Manual was issued.

(ii) Noncompliance related to the increase in embankments

205. On February 24, 2016, the *Australian Financial Review* reported that state police in Minas Gerais concluded that the Fundão dam was too high, having been raised at an average annual rate of 20 meters over the past two years, despite the recommended rate of a maximum of 10 meters per year.

(iii) Failure to conduct liquefaction studies

206. According to the criminal complaint filed by the Brazilian Federal Prosecutor's Office, on or around the end of December 2012, a company named Geoestavel recommended that Samarco undertake a survey and conduct tests in order to assess the Fundão dam's susceptibility to liquefaction. Samarco was also warned to conduct a specific study on the outcome of raising the Fundão dam's elevation to 940 m. Because of the complexity of the dam and its history of failure, Geoestavel presented to Samarco a plan to reinforce the Fundão dam, which was deemed necessary for future embankments.

207. Indeed, at least since 2007, Samarco was on notice that it should conduct studies on a dam's susceptibility to liquefaction. The meeting minutes of Samarco's Dam Committee, held on January 23, 2007, whose participants included Defendant Vescovi, show that a presentation of an assessment of the potential liquefaction of the structures of the Germano dam, a tailing dam located upstream of the Fundão dam, was made by the international consultant Peter Byrne, from which the following recommendation is extracted: "It is necessary to monitor the pore pressure and the displacements to detect the liquefaction process."

208. Only after the Fundão dam burst did Samarco request a liquefaction study, which was presented on or about January 28, 2016. The following conclusions were reached: "Considering the CPTu tests, the susceptibility to liquefaction of the sandy tailing is evident. Due to the depth restriction of the tests, it was considered that all sandy tailings are susceptible to liquefaction."

(iv) *Failure to install and monitor reading instruments*

209. As previously explained, since the start of the Fundão dam's operations in 2008, many problems plagued the dam. According to the criminal complaint filed by the Brazilian Federal Prosecutor's Office, by the end of 2009, the dam operated without proper reading

instruments. As reflected in minutes of the ITRB meeting held in September 2009, ITRB recommended that Samarco install the following instruments: piezometers, for measuring pressures; surface landmarks, for measuring horizontal stresses and deformations; flow meters, for measuring flow of the bottom drain; and rulers for measuring the water level of the reservoir and for monitoring the filling and the operations.

210. Almost two years later, at a July 2011 meeting, ITRB again reiterated to Samarco the need to establish an “adequate program for instrumentation and monitoring of galleries,” which should be “considered an essential part of the Fundão’s risk operation management.” The following individuals from Samarco attended the meeting: Ricardo Vescovi, Carlos Antônio Amorim (Operations Infrastructure General Manager) and Daviely Rodrigues Silva (Geotechnical and Hydrogeology Manager).

211. Despite these repeated warnings, Samarco did not install the proper instruments. Even the axis setback in the left abutment, whose construction commenced in 2012, had no instruments until October 2014. Instruments were installed at that time only after Pimenta’s inspection. What’s more, the electronic equipment installed to monitor the axis setback in the left abutment of the Fundão dam was removed in March and June 2015, in complete defiance of Pimenta’s recommendation. According to an investigation conducted by the Brazilian federal police, four monitoring instruments were removed from the area of the axis setback in the left abutment, 16PI008, 16PI014, 16PI015 and 16LI017. The investigation also revealed that, during the same period, instruments 16LI005, 16LI006 and 16LI008 had no battery. These instruments were also located close to the left abutment area, but below the setback. Instrument 24PI044, which was located below and to the right of the dam, also presented problems and was not repaired. The police investigation found that the instruments removed from the setback in the

left abutment were recycled and used in the Santarém dam. Samarco also removed three monitoring instruments on March 24, 2015 and another three on March 25, 2015. ***In total, Samarco removed 10 of the 12 monitoring instruments installed, despite being warned by Pimenta in September 2014 that all instruments should be monitored daily.***

(v) *Failure to relocate downstream communities*

212. At an August 10, 2011 Board of Directors meeting, ITRB recommended to Samarco's Board of Directors that the company "assess the cost and implications of the relocation of the communities located downstream of the Santarém dam and evaluate and present alternatives besides raising existing structures." In other words, realizing that any rupture of the Germano or Fundão structures would be disastrous for Bento Rodrigues and other downstream communities, ITRB recommended that Samarco relocate the downstream communities and seek alternatives to raising the Fundão dam as proper safeguards against an eventual collapse of the dam. The following individuals from BHP, Vale and Samarco participated in the meeting: José Carlos Martins (Samarco Board of Directors member appointed by Vale), Christopher Michael Campbell (Samarco Board of Directors alternate member appointed by BHP), Ian Robert Ashby (Samarco Board of Directors member appointed by BHP), Pedro Gutemberg Quariguasi Netto (Samarco Board of Directors alternate member appointed by Vale), Rogério Tavares (Samarco Board of Directors alternate member appointed by BHP), Urashni Raman (BHP's Vice President of Finance) and Ricardo Vescovi (at the time, Samarco's Operations and Sustainability Officer). Samarco, however, failed to comply with these recommendations and instead decided to raise the Fundão structure, consciously increasing the risk of the dam's rupture.

(vi) *Failure to follow the recommendations made by ITRB*

213. Despite ITRB's expertise (comprised of a group of independent and renowned consultants on matters related to dams and tailings disposals, including members Angela Küpper, Paul Abram, Waldyr Lopes and Andrew Robertson), Defendants often ignored and disregarded their recommendations. For example, in a meeting held in May 2012, ITRB expressed concerns with the lack of experience and qualification of Samarco's employees in charge of managing, operating, and monitoring the dams:

3.0 SAMARCO'S DAMS MANAGEMENT GOVERNANCE

3.1 Corporate Governance Structure

New organization of Samarco's Geotechnical management team was presented. The increase in staff is positive. The Board notes that the staff is relatively young with limited experience in large dams design and construction with the level of complexity seen at this site. Samarco recognizes this and is proposing to engage the services of an experienced dam engineering professional to provide support to the team. The Board agrees with Samarco that it is critical to have support and oversight in the interim of an experienced professional engineer with relevant experience and seasoned judgment, which is normally provided by the EOR. Samarco mentioned that Joaquim Pimenta will be invited to fulfill this role. The ITRB agrees that this is a good approach.

Operational Management

In a previous meeting the Board recommended the participation of a representative from Operations. We emphasize the importance of this to ensure the Operations team understands the importance of various issues and the priorities so they can provide better support to the Geotechnical team. For example, the separation of slimes and sand in Germano was recommended many years ago but it was not considered a priority for implementation, causing issues relative to storage capacity for slimes. We recommend that the causes for the delay and the issues associated with it be assessed in order to review the current organization and be satisfied that the current organization has the appropriate mechanisms in place to prevent future similar problems.

214. The ITRB report was submitted to Samarco's Dam Committee at the meeting held on September 25, 2012. The following Samarco representatives attended the meeting: Ricardo Vescovi (CEO), Kleber Terra (Operations and Infrastructure Officer), José Luis Santiago (Project General Manager), João Pedro (Mining Operation General Manager), Maury de Souza

(Engineer and Projects Officer), Márcio Perdigão (Environmental Licensing Manager), Germano Lopes (Geotechnical General Manager), Daviely Rodrigues (Geotechnical and Dam manager), Bruno D'Angelo (Process Engineer), Francisco Eduardo Almeida (Engineer) and Estaneslau Klein (Socio-Institutional Development Coordinator).

215. Despite ITRB's recommendations, very little was done to address these issues until the dam burst. The investigation conducted by the Brazilian federal police identified the following examples of serious failings by Defendants related to the management, operation, and maintenance of the dams:

- a) Instead of using Joaquim Pimenta to provide the necessary expertise lacking by Samarco's inexperienced team, his contract was not renewed in 2012. Samarco began using Pimenta again in October 2013, but his role was limited and he was utilized in an entirely different capacity than what ITRB had recommended. Since 2013, Pimenta was tasked with reviewing the design of projects aimed to increase the storage space for tailings accumulated as a result of Samarco's increased production;
- b) Samarco assigned key roles related to the safety of the dam's operations to the General Manager of Geotechnics, Germano Lopes, and to the Manager of Geotechnics and Dams, Daviely Lopes, whom ITRB regarded as inexperienced and lacking the adequate technical qualification to handle the complexity of the tailings system (*see* meetings minutes of the Dam Committee held on 02/29/2012 and 09/25/2012)³;
- c) Until the dam burst, Samarco failed to establish a clear routine for the approval, construction, operation, monitoring and evaluation of risks related to dams. A governance structure (with clear answers to the questions asked by the ITRB in 2012: What would be the steps? Who would be responsible? What type of review and approval would be required? By whom? And what kind of sign-off

³ These meetings were attended by executives Ricardo Vescovi, Kleber Terra, Maury de Souza, Wladyr Lopes (ITRB member), José Luis Santiago, Márcio Perdigão, João Pedro, Germano Lopes (Geotechnical General Manager), Estaneslau Klein, Daviely Rodrigues, and Francisco. The minutes of the September meeting expressly state that "[t]he committee took note of the recommendations made by the ITRB in the May 2012 meeting and considered that the actions carried out, in progress and planned by the General Geotechnical Management, are adequate to the priority and to the needs of Samarco."

is required? By whom?) was not established.

- d) Samarco failed to address material risks and failed to present such risks to ITRB in order to be monitored;
- e) Although the Dam Committee was referred in the Samarco governance chart as “the highest body that deals with tailings disposal and Dam Management,” incomprehensibly no meetings were held since February 2014, at the direction of Kleber Terra and Ricardo Vescovi.

216. According to the criminal complaint filed by the Brazilian Federal Prosecutor’s Office, members of the ITRB themselves for years have warned Samarco that its dam maintenance and operations were deficient. Member Andrew Robertson argued that the limited period and frequency of inspections and reviews by the ITRB (one weekly inspection conducted two or three times a year), which is all that Samarco allowed, was entirely inadequate for a review body to ensure the safety of the Fundão tailings structures. This information was corroborated by ITRB member Vinod Garga in his deposition.

I. Samarco’s Inadequate Emergency Action Plan

217. Despite the Samarco Board’s recommendation on August 8, 2012 “that Samarco prioritize efforts to resettle the communities near the tailings dams”—thus acknowledging the danger that the dams posed to the nearby communities—an inadequate EAP was in place at Samarco at the time of the Fundão dam’s collapse over three years later.

218. In 2009, Samarco retained RTI Consulting and Fonseca to create an EAP for its mining units, including the Germano complex and its tailings dams. In interviews with journalists, Fonseca explained that he was hired because *an independent audit of Samarco’s EAP had concluded that it did not conform to international technical rules of safety and the audit “considered the company’s emergency plan ‘a joke[.]’*” Among other deficiencies, the EAP that Samarco had in place prior to retaining Fonseca provided for no audible alarms or other

viable warning system to alert residents of towns downhill from the tailings dams. Likewise, Fonseca attended “a ‘laughable’ training program” at Samarco where, as a safety drill, people were positioned along the tailings dams themselves; if the tailings dam collapsed in a real-world scenario, those people would have instantly perished.

219. Fonseca designed a new proposed EAP to address these and other deficiencies that would have cost a mere \$1.5 million—a fraction of the \$3.289 billion in revenue that Samarco earned in fiscal year 2014, and of the cost-savings associated from completing the P4P Project under budget. Fonseca’s proposed EAP included: (i) installing a telemetric system to identify structural risks; and (ii) developing a contingency plan to rescue neighboring communities in case of an accident. The telemetric system would have provided Samarco with structural reports on its tailings dam every second. The contingency plan would have included training and preparation for Samarco employees who worked near the tailings dams and nearby residents. Fonseca believed that second-by-second monitoring of tailings dam structures using telemetric systems was the best way to coordinate safety actions in the event of an accident.

220. According to Fonseca, the Samarco Board rejected RTI Consulting’s proposed plan because it was too expensive. Fonseca confirmed that Samarco ignored the telemetric system and contingency plan recommendations from his proposed plan and continued to use an inadequate EAP.

221. Samarco employees confirmed that its EAP lacked any ability to protect Samarco’s workers or the nearby communities in the event of a tailings dam breach. For example, Lopes testified that the EAP was prepared in 2008 and was never updated or revised. Moreover, Filho, a member of Samarco’s accident response team for the dams at the Germano complex, testified that the Fundão dam had no audible alarm system and that the only training he

received on how to respond to an accident at the Fundão dam was to “consult the [EAP], and to take the actions that were the responsibility of the environment team in it[.]” Filho further testified that he had been involved in only one prior training session, which “consisted only in basic guidance on the [EAP] and information where to check documents that might be relevant in an emergency situation.” Filho “never participated in any drill for a situation in which the dam ruptures” and “is unaware of any training or meeting held with the fire department, civil defense, or divisions of the department of the environment on the [EAP] at the dams[.]”

222. The EAP had no mechanism for notifying residents in the towns directly below the Fundão dam in the event of an emergency. Lopes testified that the EAP “did not stipulate any type of notification to the district of Bento Rodrigues or to the district of Paracatu de Baixo[.]” both of which are located directly below the Fundão dam. Lopes confirmed that emergency drills conducted in 2013 and 2014 were done only for Samarco’s own teams and did not include off-site entities. Lopes did not participate in a drill in 2015, and could not say whether one was conducted.

223. Residents of Bento Rodrigues also confirmed that Samarco had no training or warning system in place. According to testimony provided by Souza—a mason who worked on the Fundão dam, had lived in Bento Rodrigues for 31 years, and was in Bento Rodrigues when the Fundão dam collapsed—Samarco “never conducted any training with the community for emergency situations[.]” Souza further testified that Samarco “did not issue any statements or warnings to the community near the rupture[.]” and “that in meetings held between the company and the community, Samarco always stated that there was not any risk of a dam break and that if this were to occur the District of Bento Rodrigues would not be affected[.]” At the time of his testimony, Souza was living in a hotel, as he was displaced by the Fundão dam collapse.

J. The Fundão Dam Collapses and Causes Unprecedented Devastation

224. The Fundão dam was a ticking time bomb. Late in the afternoon of November 5, 2015, it began to leak. While Samarco employees futilely tried to reduce the volume of water in the dam to quell the leak, it was too late—the Fundão dam burst, unleashing a colossal torrent of mud and debris hurtling toward the villages below. Within minutes, Bento Rodrigues was overrun by the mudflow, destroying everything in its path. Because the EAP did not provide for a warning system or emergency training, Samarco employees and Bento Rodrigues residents had little time to flee. The below pictures show an aerial view of Bento Rodrigues from before the collapse, in July 2015, and after, in November 2015:



225. The collapse led to the deaths of 19 people, including two children, and the mudflow traveled an astonishing 600 kilometers to the Atlantic Ocean, where it left a reddish-brown plume visible from space. The mudflow contaminated the Rio Doce River, which is used by 230 municipalities for drinking water by hundreds of thousands of Brazilians, killing aquatic life and turning protected forest and habitat into a desert of mud. The mudflow in the Rio Doce was tested and found to contain higher than acceptable concentrations of heavy metals, including arsenic, barium and manganese.

226. By November 22, 2015, the mudflow reached the Atlantic Ocean in the Espirito Santo state, forcing cities to close down access to the beaches, and continues to impact the Atlantic Ocean today. The following photograph, dated December 3, 2015, shows the mudflow spilling into the Atlantic Ocean from the mouth of the Rio Doce River:



227. In commenting on the collapse, a Bento Rodrigues resident, Paula Alves, noted that the only silver lining was that the collapse occurred on a weekday afternoon. Had it occurred at night, “[e]verybody would have died . . . We wouldn’t know where to run to. We would have died while sleeping.” Duarte Junior, the mayor of the city that includes Bento

Rodrigues, expressed a similar sentiment, stating that “[i]f the dam had collapsed at night, everyone would have died[.]”

228. The Fundão dam was as tall as a 30 story building and held enough tailings waste to fill 19 Dallas Cowboys stadiums. The collapse is widely considered to be the largest ecological disaster in the history of Brazil.

K. Mudflow From the Fundão Dam Break Contained Toxic Metals

229. In the wake of the Fundão dam break, Defendants vehemently denied that the mudflow resulting from the release of the tailings was harmful.

230. On November 16, 2015, in response to an analyst’s question about the “chemical composition of the tailings material and sediment,” BHP executive Mackenzie expressly assured “that the tailings material is reasonably inert.” He also stated: “It is not inherently active and does not contain things like heavy metals. It is slightly acidic but, with the dilution, is reasonably benign.”

231. Mackenzie repeated this claim a few days later, stating to reporters after the 11/19/15 annual general meeting, in pertinent part, that “[t]his is relatively inert material . . . it’s iron ore, clay, a bit of silica that has been finely ground. So that makes it less challenging than it might otherwise have been to remediate[.]”

232. Vale and Samarco made similar representations publicly.

233. Investors would have also reasonably believed that Defendants knew what they were talking about, and had a legitimate factual basis, when making these representations.

234. As set forth further below, however, these statements were quickly proven to be demonstrably false and misleading. During the trading day on November 25, 2015, the United Nations issued a press release concerning the detection of toxic heavy metals in the mudflow resulting from the collapse of the Fundão dam. Specifically, Tuncak, the Special Rapporteur for

the United Nations on human rights implications on hazardous substances, and Knox, the Special Rapporteur for the United Nations on human rights and the environment, reported that, based on independent scientific tests commissioned by authorities in Minas Gerais and Espirito Santo, the mudflow from the collapse contained elevated levels of toxic heavy metals such as arsenic, barium and manganese.

235. Among the tests referenced by Tuncak and Knox were laboratory analyses conducted by a Brazilian company known as Tommasi Laboratorio (“Tommasi”), which was commissioned by the water authority for the town of Baixo Guandu (approximately 430 kilometers east of Bento Rodrigues, located on the Rio Doce). The tests conducted by Tommasi took place at three locations within a 150-minute period on November 10, 2015, just five days after the collapse. Water sampled in Mariana appeared to show arsenic levels that were 2600 times higher than water sampled at the two other points, which were downstream. The tests also showed barium levels about 165 times higher in water from Mariana, and manganese levels more than 1000 times higher. Below is a photograph of the three samples taken by Tommasi:



236. A separate test conducted by the state water authority in Minas Gerais, COPASA, using water from the city of Governador Valadares on November 12, 2015 (about 350 kilometers northeast of Bento Rodrigues, located on the Rio Doce, and visible on the map included in

BHP's May 11, 2016 presentation), showed levels of manganese, aluminum and iron that were higher than Brazilian legislated standards. Below is a photograph of the samples taken from this test:



Luciano de Bem Magalães presents his water samples from the River Rio Doce before and after the mining sludge [Fabio Nascimento/Al Jazeera]

237. In addition, the Institute for Water Management in Minas Gerais (“IGAM”) conducted its own tests on the Rio Doce after the Fundão dam collapse. In total, IGAM found unacceptable levels of arsenic on one or more days between November 7 and November 12, 2015 at seven locations on the Rio Doce. IGAM’s report on these tests, which is dated November 17, 2015, was publicly released on IGAM’s website on November 24, 2015.

238. When asked specifically about Mackenzie’s statements from November 19, 2015 on the mudflow being “relatively inert,” the United Nations’ Tuncak responded that “I think the contamination speaks for itself, and it is very difficult for people to have access to what sort of other chemicals may be have been disposed of in that same tailings pond.”

239. According to the U.S. Environmental Protection Agency (“EPA”), excessive levels of arsenic in drinking water have been linked to numerous cancers, including cancer of the bladder, lungs, skin, kidney, liver and prostate, as well as paralysis and blindness. According to the Water Quality Association, excessive levels of barium in drinking water have been linked to difficulties in breathing, increased blood pressure, changes in heart rhythm, stomach irritation,

brain swelling, muscle weakness, and damage to the liver, kidney, heart, and spleen. According to the EPA, excessive levels of manganese in drinking water have been linked to toxicity to the nervous system, producing a syndrome that resembles Parkinson's disease.

240. While Defendants sought to convince investors that the mudflow was not toxic, their actions in Brazil have told another story. In an Al Jazeera article dated June 14, 2016, a local resident confirmed that Samarco continues to deliver water to people and animals along the Rio Doce and still prohibits fishing in the river. Since some local residents also bathe in the Rio Doce, Samarco has also distributed big blue tanks of water to individual houses for this purpose and has discouraged river bathing.

L. The Aftermath of the Fundão Dam Collapse

241. The fallout from the Fundão dam collapse was severe and prolonged, continuing to adversely affect Samarco—and its co-owners, BHP Brasil and Vale—to this day.

242. On December 18, 2015, a federal Brazilian court in the state of Minas Gerais ordered Defendants Samarco, BHP Brasil, and Vale to fund a comprehensive recovery plan to remediate the environmental and societal harm the collapse caused, and also ordered that licenses and concessions for existing mines operated by BHP Brasil, Vale and Samarco be suspended. In doing so, the Brazilian court found that BHP and Vale's control of Samarco made them responsible as indirect polluters:

In this case, the companies Vale S/A and BHP Billiton Brasil Ltda, as controlling entities of Samarco Mineração S/A, are not only the beneficiaries of the mining activities carried out by Samarco, but also co-responsible for the decisions made by the controlled company.

243. On December 22, 2015, it was disclosed that Samarco, BHP and Vale had engaged New York law firm Cleary Gottlieb Steen & Hamilton LLP to conduct an external investigation into the cause of the collapse. The findings of this investigation were released on

August 25, 2016. The panel conducting the investigation was asked by Samarco, BHP and Vale not to assign fault or responsibility to any individual.

244. On February 24, 2016, Brazilian state police recommended that “qualified homicide” charges be pursued against six senior Samarco employees. Qualified homicide is the Brazilian equivalent of murder aggravated by certain factors, such as a vile motive, and a conviction carries a prison sentence of 12 to 30 years. According to the Australian Financial Review, those facing prosecution include Vescovi and Terra. Police also accused these Samarco employees, including Vescovi and Terra, of endangering public health by polluting the region’s drinking water.

245. State police also claimed that the Fundão dam collapse was caused by liquefaction, which should have been identified by routine monitoring of humidity levels in the dam. Similarly, the “Report on the Immediate Causes of the Failure of the Fundao Dam” concluded that “the Fundao Tailings Dam failed on November 5, 2015 in a liquefaction flowslide that initiated at the dam’s left abutment.”

246. On March 2, 2016, in a news release filed as an attachment to Form 6-K with the SEC on March 3, 2016, BHP announced that it had reached a settlement with federal and state Brazilian authorities stemming from the \$5.2 billion lawsuit first announced on November 30 (the “Settlement”). Among other things, BHP disclosed that the term of the Settlement is 15 years, that it will require Samarco to pay at least \$1.7 billion in the initial six years, and that to the extent Samarco cannot provide these funds, BHP and Vale will be jointly 50% liable to pay such amounts.

247. On March 12, 2016, Samarco’s new CEO, Roberto Carvalho—who replaced Vescovi upon Samarco’s learning in January 2016 that criminal charges were likely forthcoming

—stated, in pertinent part, that “all [of Samarco’s] focus is turning to the restart” of mining operations at the Germano complex. The *Sydney Morning Herald* reported that Samarco expects to restart production by the start of the fourth quarter of 2016, and expects iron ore production to be 19 Mtpa, down from its pre-collapse level of 30 Mtpa, an approximately 36% reduction—*i.e.*, almost exactly the amount of the production increase achieved after implementation of the P4P Project.

248. On May 4, 2016, in a news release filed as an attachment to Form 6-K with the SEC that same day, BHP Billiton disclosed that, despite the Settlement, the Federal Prosecution Service has commenced legal proceedings against BHP Brasil, Vale and Samarco for approximately \$43 billion for social, environmental and economic compensation relating to the Fundão dam collapse.

249. On May 6, 2016, in a news release filed as an attachment to Form 6-K with the SEC that same day, BHP Billiton disclosed that a Brazilian federal court of appeal in Brasilia had approved the Settlement and that the Company would begin making payments pursuant to the schedule set forth in the Settlement. According to *Mining.com*, the total value of the Settlement can reach as high as \$6.1 billion through 2030.

250. On June 10, 2016, Brazil’s federal police formally accused Samarco of deliberate misconduct in relation to the Fundão dam collapse. *The Brazilian federal police’s official seven month investigation concluded, among other things, that Samarco had ignored clear signs that the Fundão dam was at risk of failings for years.* Federal police added that Samarco skimmed on safety spending and focused instead on increasing production. In addition, police also accused eight Samarco executives of misconduct, although their names were not disclosed.

According to Moura, head of the Brazilian federal police task force, *Samarco was “more than negligent” and the collapse was not “an accident.”*

251. According to Brazilian newspaper *Jornal ES Hoje*, the federal police investigation report referenced by Moura comprises more than 30,000 pages over 26 volumes and *concludes that Samarco, through its directors and CEO, knew the Fundão dam had cracks that control equipment was broken, and was aware of the risks to Bento Rodrigues posed by the dam.* According to Moura, “we also found that the operations manual was outdated and risk manual had not been updated for over three years.” Even worse, according to Moura, Samarco had research showing how Bento Rodrigues would be impacted in the event of a dam collapse. Moura stated that “[i]nvestigations also led us to find messages exchanged on the Samarco’s internal communication system in which the board was informed about the deficiencies of the dam.”

252. On June 22, 2016, Brazil’s Environment Ministry fined Samarco approximately \$41.6 million for damage to three protected areas resulting from the Fundão dam collapse. The Environment Ministry stated that three areas on the Atlantic coast in the state of Espirito Santo were contaminated by toxic heavy metals such as lead, copper and cadmium.

253. On July 1, 2016, in a news release filed as an attachment to Form 6-K with the SEC that same day, BHP disclosed that the Federal Prosecutor’s Office had appealed the Brasilia federal court of appeal ratification of the Settlement and that, on June 30, 2016, the Superior Court of Justice in Brazil issued an interim order suspending the decision to ratify the Settlement. The effect of the interim order is to reinstate the \$5.2 billion lawsuit disclosed on November 30. The Prosecutor Office’s \$43 billion lawsuit was unaffected by the interim order.

254. On October 27, 2016, the Minas Gerais State Attorneys General's Office filed another complaint against Samarco, Vale and BHP Brasil, seeking to recover caves that were buried by the tailings generated from Fundão Dam's collapse, and seeking additional compensation for the remaining environmental damages in the amount of US \$31 million and compensation of another US \$15 million for social damages.

255. On November 4, 2016, United Nations experts launched calls for immediate actions to address the ongoing impacts of the collapse of Fundão dam. In a statement marking the first anniversary of the disaster, the experts highlighted unresolved issues, including access to safe drinking water, river pollution, the uncertain fate of communities forced from their homes, and the insufficient response from Samarco, BHP and Vale. The experts also noted "the conclusions of the Brazilian environmental agency, IBAMA, that efforts by the companies concerned—Samarco, Vale and BHP [Brasil]—have been insufficient to stop the continuing leakage of mud from the Fundão tailing dam site in the State of Minas Gerais. We fear that more waste will reach the downstream region once the rainy season begins in the next few weeks."

256. On November 18, 2016, Brazilian Judge Jacques de Queiroz accepted the criminal charges brought by federal prosecutors against Samarco, Vale, BHP Brasil and their executives and members of Samarco's Board of Directors, including Defendants Vescovi, Terra, Potter, Moreira, Martins, Wilson, Beck, Zweig, Fernandes, for committing several crimes, including environmental crimes and homicide.

257. On January 19, 2017, Samarco, Vale and BHP Brasil entered into a preliminary agreement with the Brazilian Federal Prosecutor's Office in order to resolve certain civil allegations brought against the companies. The companies offered US \$680 million to be used

for repairing the socioeconomic and environmental damages caused by the Fundão dam's collapse. A final agreement is expected to be signed on June 30, 2017.

258. More recently, an outbreak of yellow fever that killed at least 40 people and over 600 monkeys, centered in rural areas of the state of Minas Gerais and Espírito Santo, has been linked to the Fundão dam collapse. According to Márcia Chame, a biologist from the Oswaldo Cruz Foundation, "[s]udden changes in the environment have an impact on the health of animals, including monkeys. With the stress of disasters due to the lack of food, they become more susceptible to diseases, including yellow fever."

VI. MATERIALLY FALSE AND MISLEADING STATEMENTS MADE DURING THE CLASS PERIOD

259. During the Class Period, Defendants disseminated materially false and misleading statements concerning: (A) Samarco's P4P project, its iron ore production capacity and projected performance and property, plant and equipment ("PP&E"); (B) the companies' tailings waste disposal procedures; (C) the companies' cost and capital expenditure reductions; (D) the toxicity of mudflows resulting from the expulsion of tailings from the collapse of the Fundão dam; (E) the adequacy and efficacy of the safety, risk management and monitoring practices, procedures and controls of Samarco's mining operations, and the mining operations of Vale and BHP related to the Fundão dam; (F) Defendants' concentration on, and commitment to, the health and safety of employees, residents and the communities in which Samarco's mining operations are located; and, (G) Defendants' compliance with local laws and regulations of the locales in which Samarco's mining operations are based.

A. Statements About the P4P Project, Production Capacity, PP&E and Projected Performance

1. Statements Made by Samarco

a. The 2012 Statements

260. On October 31, 2012, Samarco published an offering memorandum, offering US \$1,000,000 aggregate principal amount of 4.125% notes due 2022 (“the 2012 Offering Memorandum”). The 2012 Offering Memorandum touted the P4P project:

In April 2011, our shareholders approved the Fourth Pellet Plant Project (P4P Project), an investment of approximately R\$5,878.3 million (US\$3,265.7 million), through which we expect to expand our installed production capacity by 37% to approximately 30.5 million from approximately 22.2 million dry metric tons of iron ore pellets per year . . . The P4P Project involves: (1) the construction of a third concentrator at our Germano site, with a concentrate production capacity of 9.5 million dry metric tons per year, (2) construction of a third slurry pipeline with the capacity to transport 20 million dry metric tons of iron ore slurry per year running adjacent to our two existing pipelines, (3) the construction of a fourth pelletizing plant with a production capacity of 8.25 million dry metric tons of iron ore pellets per year at our Ponta Ubu pelletizing complex, and (4) an increase in capacity at our existing storage and maritime port facilities to 33 million dry metric tons per year . . . We expect to complete upgrades to our storage and maritime port facilities and to start operations at our third concentrator and slurry pipeline in the second half of 2013, and to start operations at our fourth pelletizing plant in the first half of 2014.

261. The 2012 Offering Memorandum made the following disclosures with respect to Samarco’s “proven project expansion and development expertise”:

We believe that the experience gained as a result of our operations of more than 35 years, our track record of successful expansions such as the completion of our recent P3P Project, and the relationships forged with our major suppliers and contractors, will further the successful completion of future expansion activities.

262. The 2012 Offering Memorandum made the following disclosures with respect to Samarco’s continued development of resources and increase in production capacity:

We intend to increase our annualized pellet production capacity with our P4P Project from approximately 22.2 million to approximately 30.5 million dry metric tons during the first half of 2014. To accomplish this, we intend to leverage our production history of more than 35 years and our experienced management and

operational teams to implement our expansion strategy and to solidify our position as one of the world's largest producers of iron ore.

We believe our P4P Project will substantially increase our production flexibility, provide us with further cost efficiencies due to our increased scale, and reduce the risk of disruption in our supply of products to our clients in the event of unscheduled disruptions to our processing, logistics and production facilities. As of June 30, 2012, we had sales contracts for the intention to purchase with various customers to acquire approximately 61% of the P4P Project's first full year of production.

263. The 2012 Offering Memorandum made the following representations with respect to Samarco's "high operating efficiency":

We are also focused on a process of continual operational improvement, and identify improvement initiatives through our budget process and mine-life planning. In conjunction with our experienced and well-trained workforce, we use external consultants to benchmark us against our industry peers and to identify improvement opportunities in the areas of mine planning, ore haulage, ore processing, pipeline transport, pelletizing and port operations, with the goal of identifying and implementing industry best practices

264. The 2012 Offering Memorandum also represented the following:

We have secured all material environmental licenses required to start construction of the P4P Project . . . and expect to start operations at the third concentrator and the third slurry pipeline in the second half of 2013 and at the fourth pelletizing plant in the first half of 2014. Overall project physical progress was 42.9% as of June 30, 2012.

As of June 30, 2012, we had sales contracts for the intention to purchase with various customers to acquire approximately 61% of the P4P Project's first full year of production.

265. The 2012 Offering Memorandum disclosed the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2011 to raise its production capacity and the productivity of its industrial plants, in addition to ensuring operational continuity and improvements, replacing equipment of the industrial plants and achieving sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

b. The 2013 Statements

266. On June 5, 2013, Samarco published its 2012 Annual Sustainability Report (the “2012 Sustainability Report”). With respect to Samarco’s production capacity, the report contained the following statements made by Defendant Vescovi:

In 2012, there was a drop in the demand for iron ore, resulting in a reduction of 19.4% in the average sales price of our pellets. In this context, we had to find a way to adjust in order to assure that we could supply the market needs with speed and quality. With the actions taken, we were able to maintain our gross profit margin in 2012 above 60%, even though the gross sales revenue fell 7.1% - from BRL 7,117.3 million in 2011 to BRL 6,610.7 million.

267. The 2012 Sustainability Report also made the following disclosure:

The P4P, which currently is the focus of most of our investments, is scheduled for start-up in January 2014. According to our planning, the Project closed out 2012 with 67.3% of progress, which includes the areas of engineering, construction and procurement.

268. On April 19, 2013, Samarco published its 2012 Management Report and Financial Statements (“2012 Management Report”), which represented that Samarco “is experiencing rapid expansion, currently developing the largest privately funded project in Brazil’s mining industry to date.”

269. The 2012 Management Report also made the following statements regarding the importance of the P4P project:

We believe we are on the right track, and our achievements exemplify this. In a context of volatile prices, it is important for us to be prepared to deliver what the market wants, meeting deadlines and guaranteeing the quality that is expected. For that reason, we will be paying particular attention to our production volume, not only in our existing plants, but also in the progress of the Fourth Pellet Plant Project (P4P), which by the end of 2012 had achieved 67.3% completion. The project, worth R\$5.4 billion, is strategic for Samarco’s growth and sustainability plans. Scheduled to become operational in January 2014, it will expand our production capacity by 37%. Its completion to time and on budget, while protecting people’s safety, respecting the environment, and sharing the benefits of that growth with society and the other stakeholders in our value chain, is all the more important to consolidate the company’s results and raise our standing in the market and country.

Doing justice to our entrepreneurial vocation and accepting our responsibility for the development and transformation of the communities in which we operate, P4P was devised from a perspective of shared value, with initiatives based on frequent dialogue with the community, the government and industry associations, together with environmental preservation and conservation actions, some of which are pioneering for large-scale projects, such as the carbon offsetting of greenhouse gas (GHG) emissions throughout the implementation of P4P.

270. On October 21, 2013, Samarco published an offering memorandum, offering US \$700,000,000 aggregate principal amount of 5.75% notes due 2023 (“the 2013 Offering Memorandum”). The 2013 Offering Memorandum made the following representations:

In April 2011, our shareholders approved the Fourth Pellet Plant Project (P4P Project), through which we are expanding our installed production capacity by 37% to approximately 30.5 million from approximately 22.2 million dry metric tons of iron ore pellets per year. The P4P Project involves: (1) the construction of a third concentrator at our Germano site, with a concentrate production capacity of 9.5 million dry metric tons per year, (2) construction of a third slurry pipeline with the capacity to transport 20 million dry metric tons of iron ore slurry per year running adjacent to our two existing pipelines, (3) the construction of a fourth pelletizing plant with a production capacity of 8.25 million dry metric tons of iron ore pellets per year at our Ponta Ubu pelletizing complex, and (4) an increase in capacity at our existing storage and maritime port facilities to 33 million dry metric tons per year, which includes the construction of a new stacker, a new reclaimer and a new shiploader . . . We expect to complete upgrades to our storage and maritime port facilities and to start operations at our third concentrator and slurry pipeline and fourth pelletizing plant in the first half of 2014.

271. The 2013 Offering Memorandum made the following disclosures with respect to Samarco’s “proven project expansion and development expertise”:

Based on the extensive knowledge and experience acquired during the P3P Project, in April 2011 the P4P Project was approved and initiated, with the same basic scope as the P3P Project, but with larger nominal production capacities. The P4P Project is underway and production is expected to start in the first half of 2014. We believe that the experience gained as a result of our operations of more than 35 years, our track record of successful expansions such as the completion of our recent P3P Project and the relationships forged with our major suppliers and contractors, will further the successful completion of future expansion activities, including the P4P Project.

272. The 2013 Offering Memorandum made the following disclosures with respect to Samarco's continued development of resources and increase in production capacity:

We intend to increase our annualized pellet production capacity with our P4P Project from approximately 22.2 million to approximately 30.5 million dry metric tons during the first half of 2014. To accomplish this, we intend to leverage history of more than 36 years and our experienced management and operational teams to implement our expansion strategy and to solidify our position as one of the world's largest producers of iron ore. We believe our P4P Project will substantially increase our production flexibility, provide us with further cost efficiencies due to our increased scale, and reduce the risk of disruption in our supply of products to our clients in the event of unscheduled disruptions to our processing, logistics and production facilities. As of June 30, 2013, we had sales contracts for the intention to purchase with various customers to acquire approximately 86% of the P4P Project's first full year of production.

273. The 2013 Offering Memorandum made the following representations with respect to Samarco's "high operating efficiency":

We are also focused on a process of continual operational improvement, and identify improvement initiatives through our budget process and mine-life planning. In conjunction with our experienced and well-trained workforce, we use external consultants to benchmark us against our industry peers and to identify improvement opportunities in the areas of mine planning, ore haulage, ore processing, pipeline transport, pelletizing and port operations, with the goal of identifying and implementing industry best practices . . .

274. The 2013 Offering Memorandum also represented the following:

We have secured all material environmental licenses required to start construction of the P4P Project . . . and expect to start operations at the third concentrator and third slurry pipeline and fourth pelletizing plant in the first half of 2014. Overall project physical progress was 90.1% as of June 30, 2013 . . . As of June 30, 2013, we had sales contracts for the intention to purchase with various customers to acquire approximately 86% of the P4P Project's first full year of production.

* * *

From 2014, the 37% increase in nominal production capacity afforded by the Fourth Pellet Plant Project (P4P) will allow us to pursue business expansion opportunities. Our main challenges are to make deliveries according to Samarco's production capacity and to maintain long-term relationships built with our customer base. As a result of these efforts, since early 2014 we have already sold

the Company's entire production volume with the P4P, estimated at 30.5 million tons of pellets/year.

275. The 2013 Offering Memorandum disclosed the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2011 and 2012 to raise its production capacity and the productivity of its industrial plants, in addition to ensuring operational continuity and improvements, replacing equipment of the industrial plants and achieving sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

276. The 2013 Interim Financial Statements, published on August 20, 2013, noted the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2012 to increase its production capacity and the productivity of its industrial plants, in addition to ensuring operational continuity and improvements, replacing equipment of the industrial plants and achieving sustainable development in accordance with the standards, policies and legislation regarding environment and health and safety.

c. The 2014 Statements

277. On June 5, 2014, Samarco published its 2013 Annual Sustainability Report (the "2013 Sustainability Report"). The report contained the following statements made by Defendant Vescovi:

In 2013, we reached a very special milestone, strengthening the foundation of our growth by implementing our Fourth Pellet Plant Project (P4P) . . . We ended the year with 98% progress on the P4P, a project that will enable a 37% increase in our annual iron ore pellet production. The Fourth Pellet Plant is the largest expansion in Samarco's history, and one of the most important projects under way in Brazil's private sector . . . With regard to the environmental requirements for the P4P, we signed the Term of Social and Environmental Commitment, an equally challenging initiative carried out within a multilateral governance-model - involving Samarco, society, and the public authorities.

278. The 2013 Sustainability Report also contained the following statements from Defendant Vescovi:

In addition to ensuring the progress of the expansion works, 2013 was a year marked by our quest for top operational efficiency, ensuring our business competitiveness in a period still marked by economic uncertainty worldwide. We closed the year with a total production of 21,125 million tons of iron ore pellets, in line with our production capacity, and posted the best sales revenue in Samarco's history: R\$7,240.2 million, 9.5% more than in 2012.

279. The 2013 Sustainability Report made the following additional disclosures: "From 2014 on, with the start-up of the Fourth Pellet Plant (P4P), we will increase our nominal production capacity by 37%, to 30.5 million tons of iron ore pellets per year. With an investment of R\$6.4 billion, the P4P is one of the major expansion projects underway in the private sector in Brazil."

280. The 2013 Sustainability Report made the following additional statements with respect to the P4P project, which was listed as a "material" topic:

To identify the topics most relevant for Samarco's business from our stakeholders' viewpoint, over 2014 we will review our Materiality Matrix. In the last consultation we conducted with our workforce and external public, in 2011, we mapped a total of 16 aspects that were material for socio-environmental management and communication . . . This process, aligned with the Global Reporting Initiative (GRI) reporting methodology, aims to concentrate Samarco's accountability efforts on issues that directly impact its business model.

The 2013 Sustainability Report also disclosed the following with respect to the P4P project: Samarco's main capital project and one of the largest in the industry in Brazil, the Fourth Pellet Plant Project (P4P) faced a pivotal period in 2013, when we were at the peak of construction and closed the year with a total progress of 98%, including the engineering, construction and procurement areas. 35 months after it got underway, we moved towards start-up in March 2014, ensuring our shareholders and Brazilian society the success of one of the most important expansion projects in the history of the Company, which will increase our nominal production capacity by 37%, to 30.5 million tons of iron ore pellets per year . . . In the execution of the works, we excelled in the management of all of our social, environmental and economic impacts. We rendered accounts, generated local development, and pursued mutual gains for the Company and for those living in the Project's area of influence.

* * *

Our capacity expansion has been accompanied by actions to manage the social and environmental impacts of the Project.

281. On September 26, 2014, Samarco published an offering memorandum, offering US \$500,000,000 aggregate principal amount of 5.375% notes due 2024 (the “2014 Offering Memorandum”). The 2014 Offering Memorandum made the following representations:

To capitalize on the opportunity presented by projected strong demand for iron ore from current and potential clients in Asia and the Middle East, we expanded production capacity by approximately 37.0% to approximately 30.5 million dry metric tons from approximately 22.2 million dry metric tons of iron ore pellets per year in March 2014, through the completion of our Fourth Pellet Plant Project (P4P Project). The P4P Project began in April 2011 and involved: (1) the construction of a third concentrator at our Germano site, with a concentrate production capacity of 9.5 million dry metric tons per year, (2) construction of a third slurry pipeline with the capacity to transport 20.0 million dry metric tons of iron ore slurry per year running adjacent to our two existing pipelines, increasing our total slurry pipeline capacity to 44.0 million dry metric tons of iron ore slurry per year, (3) the construction of a fourth pelletizing plant with a production capacity of 8.3 million dry metric tons of iron ore pellets per year at our Ponta Ubu pelletizing complex, increasing our total production capacity to 30.5 million dry metric tons of iron ore pellets per year, and (4) an increase in capacity at our existing storage and maritime port facilities to 33.0 million dry metric tons per year from 24.0 million dry metric tons per year, which includes a new stacker, a new reclaimer and a new shiploader.

282. The 2014 Offering Memorandum made the following disclosures with respect to Samarco’s “proven project expansion and development expertise”:

Based on the extensive knowledge and experience acquired by management and our shareholders during the P3P Project, in April 2011 the P4P Project was approved and initiated, with the same basic scope as the P3P Project, but with larger nominal production capacities. The P4P Project was completed within 35 months in March 2014 with a total capital expenditure of R\$6,459.3 million (US\$3,250.9 million). As of June 30, 2014, the P4P Project had delivered 1.1 million dry metric tons of pellets since commencing operations. As of June 30, 2014, we had sales contracts with various customers covering approximately 100.0% of the P4P Project’s 2014 production. We believe we have consistently created value through our organic development projects and profitably grown our business across industry cycles. Over the past ten years, we have achieved an average gross profit margin of 61.0%. We believe that the experience gained as a result of our operations of more than 35 years, our track record of successful expansions such as the completion of our P3P and P4P Projects and the relationships built with our major suppliers and contractors, will further the successful completion of future expansion activities.

283. The 2014 Offering Memorandum made the following disclosures with respect to Samarco's continued development of resources and increase in production capacity:

In connection with our strategy to strengthen our position in the global iron ore pellet market we believe that the completion of the P4P Project substantially increases our production flexibility, provides us with further cost efficiencies due to our increased scale, and reduces the risk of disruption in our supply of products to our customers in the event of unscheduled disruptions to our processing, logistics and production facilities.

* * *

In connection with our strategy to strengthen our position in the global iron ore pellet market we recently completed the P4P Project, which has expanded our installed annual iron ore pellet production capacity by 37.0% to approximately 30.5 million metric tons by 2014. We believe that the completion of the P4P Project substantially increases our production flexibility, provides us with further cost efficiencies due to our increased scale, and reduces the risk of disruption in our supply of products to our customers in the event of unscheduled disruptions to our processing, logistics and production facilities. As of June 30, 2014, we had sales contracts with various customers covering approximately 100.0% of the P4P Project's 2014 production.

284. The 2014 Offering Memorandum made the following representations with respect to Samarco's "high operating efficiency":

We are also focused on operational improvement and identify improvement initiatives through our budget process and five year plan process. Our experienced and well-trained workforce uses external consultants to benchmark us against our industry peers and to identify improvement opportunities in the areas of mine planning, ore haulage, ore processing, pipeline transport, pelletizing and port operations, with the goal of identifying and implementing industry best practices.

285. The 2013 Management Report noted the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2013 to raise its production capacity and the productivity of its industrial plants, in addition to ensuring operational continuity and improvements, replacing equipment of the industrial plants and achieving sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

286. The 2014 Interim Financial Statements, published on August 21, 2014, stated the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2013 to raise its production capacity and the productivity of its industrial plants, in addition to ensuring operational continuity and improvements, replacing equipment of the industrial plants and achieving sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

d. The 2015 Statements

287. On April 16, 2015, Samarco published its 2014 Management Report and Financial Statements (the "2014 Management Report"). The 2014 Management Report disclosed the following regarding Samarco's production capacity: "In 2014 our nominal production capacity will expand by 37% with the delivery of the Fourth Pellet Plant Project (P4P)."

288. The 2014 Management Report disclosed that "with the delivery of the Fourth Pellet Plant Project, we closed a cycle of major investments in infrastructure and socio-institutional projects, which boosted the development of the territory and brought concrete improvements to the lives of thousands of inhabitants from Minas Gerais and Espirito Santo."

289. On June 5, 2015, Samarco published its 2014 Sustainability Report (the "2014 Sustainability Report"), which represented that with respect to Samarco's production capacity, "37% was the increased capacity provided by the implementation of the Fourth Pellet Plant" and "15.4% was the production increase achieved with the start-up of Fourth Pellet Plant." Samarco's 2014 Sustainability Report also stated that "[d]uring the [2014] year, the production volume of iron ore pellets and pellet feed reached 25.075 million metric tons, an increment of over 15% compared to the previous year (when it was 21.737 million tons). This was driven by the start-up of the Fourth Pellet Plant Project."

290. The 2014 Sustainability Report made the following additional disclosures: “The [P4P] project had the goal of increasing annual production capacity by 37%” and “Samarco’s current nominal production capacity is 30.5 million tons per year of iron ore pellets, after the startup of the Fourth Pellet Plant Project (P4P) in 2014. During last year [2014], we produced 25.075 million tons of iron ore pellets and pellet/sinter feed, reaching a gross revenue of R\$ 7,601.3 million, 5% more than in 2014, and the highest in the Company’s history.”

291. The 2014 Sustainability Report also disclosed the following:

The expectation is that in 2015 we will be able to reach the top annual nominal production capacity of 30.5 million (37% above the level prior to project completion). The start-up of the P4P comes together with a strategy for reducing costs and offsetting the lower iron ore prices, through increased volume and efficient use of production capacity. As we operate in a competitive market, our strategy is to maintain leadership in terms of low cost, in order to protect the Company from price variations and assure a stable net margin.

Even in this unstable market environment and facing the challenges of implementing P4P, our sales reached 100% of 2014 production, with 25.129 million tons exported (pellets plus pellet feed). The increment was of 15.6% compared to 2013 (21.737 million tons).

292. The 2014 Sustainability Report made the following additional statements with respect to the P4P project, which was listed as a “material” topic:

Lending continuity to our normal processes of consulting and communicating with our stakeholders, in 2014 Samarco carried out a new materiality process, in order to define and update its list of relevant themes, according to the perception of internal and external stakeholders.

* * *

The new materiality matrix seeks a greater consistency with the Strategy Map and the Sustainability Model, in order to prioritize actions and strategies which respond to the immediate needs of the Company and our stakeholders.

293. The 2014 Sustainability Report also disclosed the following with respect to the P4P Project:

In 2014, with the delivery of the Fourth Pellet Plant Project, we closed a cycle of major investments in infrastructure and socio-institutional projects, which boosted

the development of the territory and brought concrete improvements to the lives of thousands of inhabitants from Minas Gerais and Espirito Santo.

294. The 2014 Management Report noted the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout 2014 to increase its production capacity and the productivity of its industrial plants, ensure operational continuity and improvements, replace equipment of the industrial plants and to achieve sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

295. The 2015 Interim Financial Statements, published on August 21, 2015, noted the following with respect to Samarco's PP&E, including P4P:

The Company made a number of investments throughout previous years to increase its production capacity and the productivity of its industrial plants, ensure operational continuity and improvements, replace equipment of the industrial plants and to achieve sustainable development in accordance with the standards, policies and legislation regarding the environment and health and safety.

2. Statements Made by Vale

a. The 2013 Statements

296. Vale's 2012 Annual Report, filed as an attachment to Form 20-F with the SEC on April 12, 2013, provided as follows with respect to Samarco's P4P: "Samarco IV. Construction of Samarco's fourth pellet plant with a nominal capacity of 8.3 Mtpy, a concentrator with a nominal capacity of 10.5 Mtpy, a pipeline with a nominal capacity of 20 Mtpy, and expansion of related mine and maritime terminal infrastructure." Vale also added that it is "[b]uilding a fourth pellet plant with a capacity of 8.3 Mtpy, which will increase Samarco's total nominal pellet capacity to 30.5 Mtpy."

b. The 2014 Statements

297. Vale's 2013 Annual Report, filed as an attachment to Form 20-F with the SEC on March 27, 2014, provided as follows with respect to Samarco's P4P: "In 2014, we will start up

the fourth pellet plant with a capacity of 8.3 Mtpy, which will increase Samarco's total nominal pellet capacity to 30.5 Mtpy."

c. The 2015 Statements

298. Vale's 2014 Annual Report, filed as an attachment to Form 20-F with the SEC on March 20, 2015, provided as follows with respect to Samarco's P4P: "In 2014, we started up the fourth pellet plant with a capacity of 8.3 Mtpy, which will increase Samarco's total nominal pellet capacity to 30.5 Mtpy."

3. Statements Made by the BHP Defendants

a. The 2013 Statements

299. BHP Billiton's 2013 Annual Report, filed as an attachment to Form 20-F with the SEC on September 12, 2013, noted with respect to Samarco's P4P that "[i]n April 2011, Samarco's shareholders approved the fourth pellet plant." Specifically, with respect to P4P, the report provided that "[d]uring FY2011, Samarco shareholders approved a US \$3.5 billion (BHP Billiton share US \$1.75 billion) expansion project consisting of a fourth pellet plant, a new concentrator and a third slurry pipeline. The Fourth Pellet Plant Project (P4P) is expected to expand Samarco's iron ore pellet production capacity from 22.3 Mtpa to Mtpa. First pellet production is expected in the first half of CY2014. The project was 90 per cent complete as at 30 June 2013."

b. The 2014 Statements

300. BHP Billiton's 2014 Annual Report, filed as an attachment to Form 20-F with the SEC on September 11, 2014, provided as follows with respect to Samarco's P4P: "[d]uring FY2011, Samarco shareholders approved a US \$3.5 billion (US \$1.75 billion BHP Billiton share) expansion project, the Fourth Pellet Plant Project (P4P), consisting of a fourth pellet plant, a new concentrator and a third slurry pipeline. The project is complete, with its first pellet

production in March 2014. This has expanded Samarco's iron ore pellet production capacity from 22.3 Mtpa to 30.5 Mtpa. The final cost of the project was US \$3.2 billion (US \$1.6 billion BHP Billiton share)."

c. The 2015 Statements

301. Throughout 2015, the BHP Defendants periodically provided updates on the impact that the P4P Project has had on Samarco's production capacity. In a January 21, 2015 press release, filed as an attachment to Form 6-K with the SEC on the same date, BHP Billiton provided investors with BHP's operational review for the half year ended December 31, 2014, and, with respect to Samarco, stated: "Samarco production increased by 29 per cent in the December 2014 half year to a record 14 million tons ("Mt") (100 per cent basis) as the ramp-up of the fourth pellet plant continues to plan."

302. In an April 22, 2015 press release, filed as an attachment to Form 6-K with the SEC on the same date, BHP Billiton provided investors with BHP's operational review for the nine months ended March 31, 2015, and, with respect to Samarco, stated: "Samarco production for the nine months ended March 2015 increased by 37 per cent to a record 22 Mt (100 percent basis) as the fourth pellet plant reached full capacity during the period."

303. Likewise, in a July 22, 2015 press release, filed as an attachment to Form 6-K with the SEC on the same date, BHP Billiton provided investors with its operational review for the year ended June 30, 2015, and, with respect to Samarco, stated: "Samarco production increased by 33 per cent in the 2015 financial year to 29 Mt (100 per cent basis) as the fourth pellet plant ramped up to full capacity during the March 2015 quarter."

304. In the 2015 Form 20-F, filed with the SEC on September 23, 2015, BHP Billiton continued to make incomplete representations concerning Samarco and the P4P Project, stating, in pertinent part, that: "Samarco production increased by 33 per cent to 29 Mt (100 per cent

basis) as the fourth pellet plant ramped up to full capacity.” A similar statement was made in the BHP Billiton Operational Review for the Quarter Ended on September 30th, 2015, which was published on October 21st, 2015.

4. Reasons Why the Statements Concerning the P4P Project, Production Capacity, PP&E and Projected Performance Were False and Misleading

305. The statements above regarding the P4P project, production capacity, PP&E and projected performance were false and misleading in the absence of disclosure of the significant structural and other problems affecting those mining operations. Those issues, which Defendants knew or recklessly disregarded, remained unaddressed and undermined the reasonableness of representations regarding Samarco’s P4P project, Samarco’s production capacity or status. It was misleading to make such production representations without disclosing the existence of adverse issues and conditions that reasonably could prevent Samarco from achieving such production on an ongoing basis.

B. Statements Concerning Tailings and Waste Disposal

1. Statements Made by Samarco

a. The 2012 Statements

306. Samarco’s 2012 Offering Memorandum included an Audit of Ore Reserves, which stated the following with respect to tailings and waste disposal:

Samarco has an in-house engineering team with responsibility for design, construction and monitoring of the tailings disposal facilities. This team is supported by geotechnical consultants for stability analysis and design work. An independent technical review board formed by Brazil based professionals provides oversight of the tailings operations on a regular basis. An international tailings consultant completes an annual review of the tailings operations as well.

b. The 2013 Statements

307. Samarco's 2012 Sustainability Report pointed out its monitoring techniques with respect to tailings management:

We have a system, at the Germano unit (MG), comprising three dams, where the tailings generated at the processing stage are stored. The water derived from that process is reused internally and also treated in the Industrial Waste Treatment Stations. In order to ensure risk identification and control, as well as the impacts related to tailings management, we use the FMEA (Failure Modes and Effects Analysis) methodology. That analysis technique may be used to assess the potential for the occurrence of failures in structures, equipment and processes, as well as the possible consequences for the environment, and health and safety of people.

308. Samarco's 2012 Sustainability Report made the following additional statements with respect to tailings:

We are studying economically feasible ways to reuse our tailings, as well as disposal technologies with lower impact than those used nowadays. Samarco's Tailings Disposal Plan (TDP) is a document with the information used to support the operations until the depletion of the ore reserves.

309. Samarco's 2012 Sustainability Report also contained the following statements with respect to the company's increase in tailings generated in 2012:

In 2012, the two iron ore concentration plants generated 16.69 million tons of tailings, separated into slime and sand. Those materials were conveyed and disposed of in Germano and Fundão dams and in the Germano pit stacking. The increase in generation, compared to 2011, occurred due to the high production of the concentration plants and also of beneficiated iron ore, which had a lower content of iron than in the previous year, and thus contributed to the increased volume of tailings in the dam.

310. Samarco's 2013 Offering Memorandum included an Audit of Ore Reserves, which stated the following with respect to tailings and waste disposal:

Samarco presented Golder [company retained by Samarco to issue an audit of ore reserves for the Germano-Alegria mining complex] with a Master Plan for Tailings Disposal. According to the information provided, 1.65 billion dry tonnes (Bt) of tailings will be generated to exploit the reserves up to 2053. Out of this total, about 1 350 million dry tonnes (Mt) corresponds to sandy tailings and 291 Mt to slimes tailings. These have a deposited dry density of 1.60 t/m³ and 1.47

t/m³, respectively. Considering those values, there will be a need for storage of about 843 million cubic meters (Mm³) and 198 Mm³ of sandy and slimes tailings storage structures for the planned production, respectively. Samarco informed Golder that these volumes will be stored at the following structures defined in Figure 45 and Table 40 [Germano and Fundão Dams; Fundão Buttress; Mirandinha Dam; Camargos Dump].

Samarco informed Golder that these volumes will be stored in at the following structures defined in Figure 45 and Table 40.

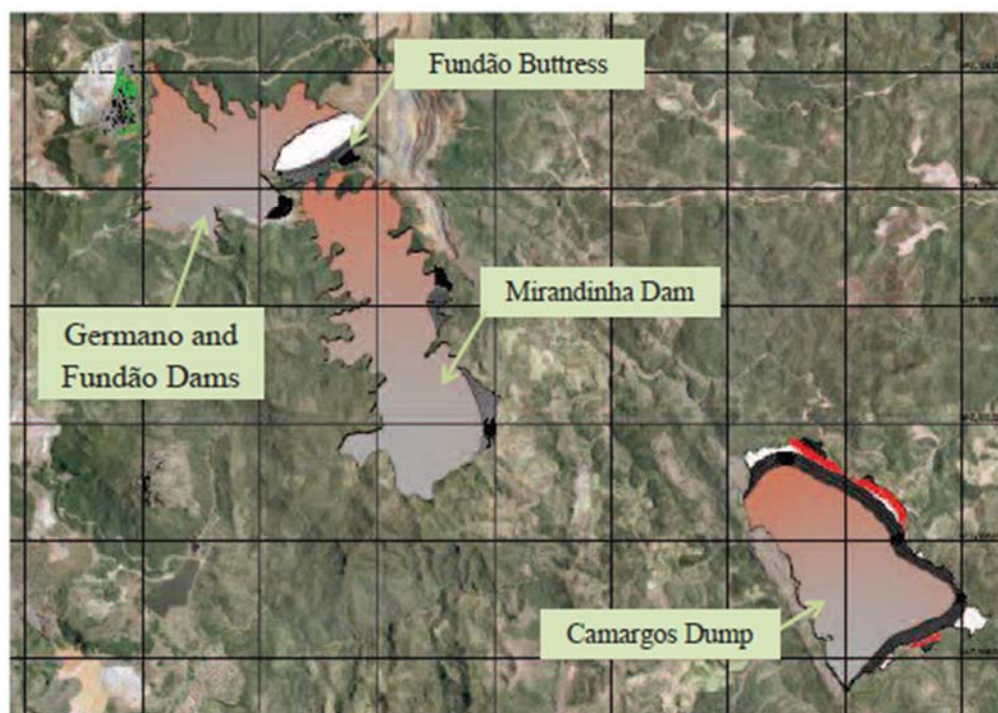


Figure 45: Tailings deposits as planned by Samarco

Table 40: Tailings Deposits - Capacities and Schedule as planned by Samarco

Structure	Schedule	Volume (Mm ³)		
		Slimes	Sandy	Total
Germano Dam - El. 920m	2012-2013	4.37	3.86	8.23
Fundão Dam - El. 920m	2012-2018	21.43	55.84	77.27
Fundão Buttress – El. 920m	2016-2021	-	35.53	35.53
Germano and Fundão Dams, Buttress included - El. 940m	2017-2027	40.25	64.21	104.46
Mirandinha Dam – El. 840m	2019-2053	171.53	279.98	451.21
Camargos Dump – El. 855m	2025-2053	-	612.00	612.00
TOTAL	LOM	243.58	1 045.12	1 288.70

c. The 2014 Statements

311. Samarco's 2013 Sustainability Report contained the following statements: "Tailings and waste rock materials generated in these processes are stored in dams and waste rock piles or dumps, structures which are monitored and controlled in accordance with the environmental legislation."

312. Samarco's 2013 Sustainability Report also contained the following statements with respect to the company's sustainability goals:

In 2013, with the involvement of all departments and the participation of several general managers and directors, we set sustainability goals that reflect the key environmental, social and economic issues related to the Company's goals and vision for the future. Among them are challenges that are particularly complex and refer to the responsible management of the impacts brought about by the mining business, such as . . . making more efficient use of our dams, with an emphasis on tailing and waste management. Targets have already been set for some of these goals.

313. Samarco's 2013 Sustainability Report listed the following among its sustainability goals: "Stop using 295 million cubic meters of space available in our dams. This includes: 1) employ a more efficient process with lower production of slimes and sandy material; 2) develop technologically and economically feasible processes to use these co-products, and 3) optimize the disposal of these coproducts among the current structures."

314. Samarco's 2013 Sustainability Report made the following additional representations with respect to tailings:

In 2013, we continued actions focused on critical issues related to our segment, such as the management of water and wastewater, waste and tailing generation . . . In total, we invested approximately R\$183.2 million in environmental improvements, of which R\$75.5 million were related to investments in the P4P and R\$107.7 million were associated with improvements in environmental control operations . . . At the Germano unit, attention is focused on extraction and on more efficient iron ore use, on efficient tailing and waste disposal management, on optimized use of new water, and on wastewater management. Along the ore pipelines, our concern is to control erosion on the easement and to prevent leaks.

315. Samarco's 2013 Sustainability Report disclosed the following additional information with respect to waste rock and tailings:

At Samarco, all tailings (sandy materials and slimes) generated in the iron ore beneficiation stage are stored in a system composed of three dams - Germano, Fundão and the Germano pit - located in Germano (MG). Water from this process is treated in the industrial wastewater treatment stations and stored in the Santarém Dam, from where part of the water is pumped for reuse in the process. The waste rock, meanwhile, is disposed of in a controlled manner, in accordance with safety procedures and environmental laws, in the João Manuel and Alegria Sul waste dumps. We will also soon use the Natividade waste rock pile, currently in its final study stages.

We analyze and control operational risks, as well as impacts related to tailings management, based on the Failure Modes and Effects Analysis (FMEA) methodology, which evaluates the potential of failures in structures, equipment and processes at the dams, as well as possible impacts on the environment and personal health and safety. In 2013, the generation of tailings resulting from the two iron ore concentration plants added up to 16.54 million tons, between sandy materials and slimes. The mass of waste rock handled, an operation done to release ore as the mining face advances, reached 9,826,587 wet metric tons in 2013.

316. Samarco's 2013 Sustainability Report also disclosed the following pertinent information:

Our Tailings Disposal Plan (RDP) provides the main guidelines to support us through the ore reserve depletion process. The latest review, conducted in 2013, shows that we have made significant progress in controlling the volumes of waste generated and disposed of, resulting in the equalization of the reservoirs of Fundão Dam's dikes 2 and 1.

From the viewpoint of the safety of our operations, we have the Emergency Action Plan (EAP) for the dams, which addresses the operation of the tailings disposal structures and possible anomalies or emergencies. Based on this document, which meets the legal requirements on dam management, in 2013 we held 1356 hours of training with employees directly or indirectly involved in the activities. We also carried out a drill to check actions, behaviors, procedures, and resources in emergency situations. In addition, we made progress throughout the year in studies that will allow the reuse of discarded materials and waste and/or waste rock filtration.

* * *

Our tailings pond system is monitored to prevent incidents and ensure minimal environmental impact from our operations.

* * *

Projects have been developed to maximize the efficient use of materials deposited in our tailings ponds.

d. The 2015 Statements

317. With respect to waste and tailings, Samarco's 2014 Sustainability Report made the following statements:

In Samarco, all tailings (sandy materials and slimes) generated in the iron ore beneficiation stage are stored in a system composed of the Germano and Fundão dams and stockpile in the Germano pit, at the Germano unit (MG). Water from this process is treated in the Industrial Wastewater Treatment Plants and stored in the Santarém dam, where part is pumped for reuse in the process. Waste is discarded in accordance with safety procedures and environmental laws along the waste piles João Manoel and Alegria Sul.

The analysis and control of risks are carried out by the methodology Failure Modes and Effects Analysis (FMEA), which assesses the potential of occurrences and failures in dams and potential consequences on the health and safety of people and the environment.

318. Samarco's 2014 Sustainability Report also made the following disclosures:

In 2014, the generation of tailing reached 21.978 million tons, between sandy materials and slimes. Waste mass moved to release ore as mining activities advance recorded 5,988,493 natural metric tons in 2014. The main document governing the issue is the Tailings Disposal Plan (RDP), which provides guidelines to support us until the process of depletion of ore reserves.

From the perspective of safety of our operations, we have the Emergency Action Plan (PAE) of dams, which addresses the operation of the tailings disposal structures and possible malfunctions or emergencies. Based on this document that meets the legal requirements on dam management, in 2014 we implemented a total of 1,356 hours of training with employees directly or indirectly involved in the activities. In 2014, a coffer dam system was also implemented in the Santarém Dam to increase the ability to store water for reuse. At the same time, the water resources program is developing several projects aimed at increasing efficiency in water use.

319. With respect to investments in the area, Samarco 2014 Management Report and Financial Statements represented that “[i]nvestments in environmental management in 2014 were focused on improving resource efficiency, ensuring compliance and managing impacts in areas such as waste, tailings, water and greenhouse gas and particulate emissions.”

2. Statements Made by Vale

a. The 2013 Statements

320. Vale’s 2012 Sustainability Report, published in April 2013, which comprises “affiliates in which Vale owns 20% to 50% of the voting capital, either directly or indirectly, and companies or entities over which Vale exercises shared control,” expressly mentioning Samarco, contained the following statements regarding tailings and mining waste:

Vale’s commitment to environmental and social issues is also reflected in the way the company manages specific kinds of waste in its production process. These materials are disposed of in tailings dams (containing tailings and sediments) and piles (containing waste rock and tailings), and their volume is directly linked to production and geological characteristics at the site.

321. Vale’s 2012 Sustainability Report made the following additional statements:

In 2012, Vale invested approximately US\$281.5 million in dams, dikes and waste rock piles, representing the largest share of the company’s environmental expenditure (27%). In this area, Vale seeks to optimize waste rock and tailings disposal processes, through various initiatives, such as the following:

- Mining and recovery of iron ore in tailings dams and waste rock piles;
- Recovery and utilization of these materials in other industrial processes, such as the production of cement, ceramics and other aggregates;
- Segregation of waste rock, making separate piles of materials with the highest iron ore content, which may potentially be reused in future in the light of possible new technologies;
- Evaluation of alternative waste disposal methods, without compromising geotechnical safety, reducing the number of conventional dams, since large volumes may be contained in such dams and piles, and so it is

essential to ensure that such structures are stable in order to control the risk of impacts.

322. Vale's 2012 Sustainability Report also disclosed the following:

In 2009, Vale established its Management System for Dams and Piles, which permitted advances in waste management, and implemented action plans arising from safety recommendations by independent audits.

This system underwent functional improvements in 2012 to allow interaction with other systems within the company, providing increased robustness for modules. The process of implementing the Dam Safety Plan was also initiated, based on the Brazilian Federal Law 12,334/2010, which establishes the National Dam Safety Policy.

323. Vale's 2012 Sustainability Report also made the following representations:

In 2012, there was an increase of approximately 2% in Vale's generation of mining waste, which reached 884 million metric tons. The generation of waste rock and tailings resulting from iron ore production increased by approximately 9%, due to an increase at some major units in the amount of waste rock removed to extract the same amount of ore. This ratio varies in line with the geological characteristics of mines. Some units also began to mine new areas, which contributed to this increase.

Other business units showed an overall decrease in production (such as lower nickel production and the sale of manganese operations), leading to a reduction in the generation of other kinds of tailings, down 6.7% from 2011.

b. The 2014 Statements

324. Vale's 2013 Sustainability Report, which comprises companies that Vale manages, including Samarco, published in April 2014, contained the following statements regarding mining waste and tailings:

Vale dams are constructed and operated following strict safety standards and audited periodically to monitor and reduce all potential risks, including structural failures. The geochemical characteristics of mineral waste are also analyzed in order to identify risks related to the potential to generate acid drainage.

Based in the National Dam Safety Brazilian Policy, Vale presented in 2013 the stability statements and regular inspection reports of tailings dams. According to this Law, 98% of our tailings dams in Brazil are classified as "Low Risk", indicating excellent levels of safety management.

The work includes conducting technical safety audit every three years. In 2013, dams in Minas Gerais were audited and the results indicate a significant and progressive improvement of safety levels compared to previous years. In addition to the periodic inspections and audits regulated by the National Dam Safety Policy, the management process is assessed periodically through specific audits in compliance international standards technically and scientifically recognized - applied when there are no specific regulations - associated to control requirements specified in the Sarbanes-Oxley Act.

c. The 2015 Statements

325. In May 2015, Vale issued a “Report to the Community” stating that “we are recognized in the industry for our considerable efforts to improve our tailings and water management facilities.”

326. Vale also made the following statements regarding tailings dams in that report:

In addition to Vale’s highly-qualified staff in the area of tailings and water management who visually and remotely patrol and monitor tailings dams on a daily basis, Vale consults with individual experts in various fields such as geotechnical engineering, hydrology, seismicity and the environment to manage our tailings in a safe and responsible way.

3. Statements Made by the BHP Defendants

a. The 2013 Statements

327. BHP Billiton’s 2013 Annual Report, filed as an attachment to Form 20-F with the SEC on September 12, 2013, and BHP’s Sustainability Report,⁴ published on that same day, both containing specific references to Samarco, provided as follows with respect to “Managing waste”:

Mining and minerals processing operations produce large quantities of mineral waste, including waste rock, tailings and slag, which need to be effectively managed. Our operations are required to implement and maintain Waste Management Plans, which address waste minimisation, storage, transportation

⁴ BHP’s Sustainability Report was made by BHP Billiton Ltd., BHP Billiton Plc, and their subsidiaries, including BHP Billiton Brasil Ltda.

and disposal in a manner that controls the risk of adverse impacts on the environment and communities.

Tailings dams are operated, monitored and assessed to manage material risks, including the risk of failure. We are required to analyse mineral wastes and identify potential impacts arising from erosion, acid rock drainage, salinity, radioactivity and metal leaching. Our Environment GLD prohibits the disposal of tailings or waste rock into river or marine environments.

b. The 2014 Statements

328. BHP's 2014 Sustainability Report, published on September 11, 2014, which includes specific references to Samarco, contained the following statements regarding mined waste rock or tailings: "To avoid environmental impacts and protect the environment in a way that demonstrates Our BHP Billiton Charter values, we have committed to environmental obligations, which are detailed in our Environment GLD: ...We will not dispose of mined waste rock or tailings into a river or marine environment."

c. The 2015 Statements

329. BHP's 2015 Sustainability Report, published on September 11, 2015, which includes specific references to Samarco, contained the following statements regarding mined waste rock or tailings: "To avoid environmental impacts and protect the environment consistent with Our Charter values, we have committed to environmental obligations, detailed in our Environment GLD, against which we screen all our activities. These include: ... We will not dispose of mined waste rock or tailings into a river or marine environment."

4. Reasons Why the Statements Concerning Tailings and Waste Disposal Were False and Misleading

330. The above statements regarding tailings and waste disposal were false and misleading because, as described in detail above, Defendants consciously or recklessly disregarded the risks posed by the increase in tailings and Samarco's failure to implement a viable plan to handle the increase in tailings. For example, production was dramatically

increased without appropriate management of the tailings storage facilities needed to store the proportional increase in wastes. In the meantime, pursuant to its agreement with Samarco, Vale continued to deposit significant amounts of waste in the Fundão dam, which was not disclosed to the market or to the Brazilian authorities.

C. Statements Concerning Cost and Capital Expenditure Reductions

1. Statements Made by Samarco

a. The 2012 Statements

331. The 2012 Offering Memorandum disclosed the following with respect to Samarco's cost initiatives and "efficient" mining operations:

We are in the lowest cost quartile of the global iron ore pellet cost curve on an FOB basis, based on an analysis by CRU in 2011. The cornerstone of our cost reduction strategy is to maximize production outputs, leverage economies of scale and continually improve efficiency, mainly through investment in new long-term supply relationships with more favorable price terms and initiatives such as Lean Six Sigma projects, which are aimed at improving consumption of certain intakes of materials, thus increasing productivity. In 2011, we received various awards from the International Quality Productivity Center in the main category of the Lean Six Sigma Award.

We are also focused on a process of continual operational improvement, and identify improvement initiatives through our budget process and mine-life planning. In conjunction with our experienced and well-trained workforce, we use external consultants to benchmark us against our industry peers and to identify improvement opportunities in the areas of mine planning, ore haulage, ore processing, pipeline transport, pelletizing and port operations, with the goal of identifying and implementing industry best practices, the last of which was carried out by Europraxis and concluded in 2011.

332. The 2012 Offering Memorandum made the following representations with respect to Samarco's cost production and maintenance:

Our maintenance policy aims to increase the availability of our assets while reducing production costs and ensuring the quality and safety of our operations. Maintenance activities are carried out by various departments that are responsible for routine tasks, in accordance with the studies and strategies outlined by our maintenance engineering department, which consists of planning, inspection, reliability, spare parts engineering and design teams. Our maintenance

engineering department also has a continuous improvement team dedicated to increasing the life cycles of spare parts, developing new supplier relationships and designing new equipment aimed at increasing productivity, quality and safety.

b. The 2013 Statements

333. Samarco's 2012 Sustainability Report contained the following statements made by Defendant Vescovi with respect to cutting costs and increasing productivity:

In 2013, we are going to work towards consolidating this model, establishing goals and commitments to reduce socioenvironmental impacts, cut costs, and increase productivity, so that we can achieve our 2022 Vision of doubling the Company's worth.

334. The 2012 Sustainability Report also stated:

We work to periodically improve our contract management services, reviewing controls and evaluation and chain development procedures. For 2013, we plan to modernize our system, focusing on reducing costs, increasing productivity and structuring governance on this topic, as well as on making improvements to the evaluation model, considering the different categories of suppliers.

335. The 2013 Offering Memorandum disclosed the following with respect to Samarco's cost initiatives and "efficient" mining operations:

We produce iron ore pellets, which are a premium input used in the steel production industry ... We currently produce iron ore pellets with an average of 67.0% and 67.8% Fe content depending on customer specifications. Our ability to produce high "Fe" or iron ore content pellets, particularly for direct reduction plants, positions us to command higher prices per metric ton for our pellets as a result of our pellets' ability to increase our clients' steel production efficiency.

We are one of the lowest cost producers of pellets in the world on an FOB basis according to estimates by CRU in 2012. The development of our advanced and efficient mining, energy generation and logistics operations has been integral to our growth and reducing our costs, and represents one of our key competitive advantages.

336. The 2013 Offering Memorandum also disclosed the following with respect to Samarco's cost initiatives and "efficient" mining operations:

We are in the lowest cost quartile of the global iron ore pellet cost curve on an FOB basis, based on an analysis by CRU in 2012. The cornerstone of our cost reduction strategy is to maximize production outputs, leverage economies of scale

and continually improve efficiency, mainly through investment in new long-term supply relationships with more favorable price terms and initiatives such as Lean Six Sigma projects, which are aimed at improving consumption of certain intakes of materials, thus increasing productivity. We have received various awards from the International Quality Productivity Center since the implementation of our Lean Six Sigma program, including Best Lean Six Sigma Program in Latin America and Second Best Manufacturing Project in Latin America in 2012.

We are also focused on a process of continual operational improvement, and identify improvement initiatives through our budget process and mine-life planning. In conjunction with our experienced and well-trained workforce, we use external consultants to benchmark us against our industry peers and to identify improvement opportunities in the areas of mine planning, ore haulage, ore processing, pipeline transport, pelletizing and port operations, with the goal of identifying and implementing industry best practices, the last of which was carried out by Europraxis and concluded in 2011.

337. The 2013 Offering Memorandum made the following representations with respect to Samarco's cost production and maintenance:

Our maintenance policy aims to increase the availability of our assets while reducing production costs and ensuring the quality and safety of our operations. Maintenance activities are carried out by various departments that are responsible for routine tasks, in accordance with the studies and strategies outlined by our maintenance engineering department, which consists of planning, inspection, reliability, spare parts engineering and design teams. Our maintenance engineering department also has a continuous improvement team dedicated to increasing the life cycles of spare parts, developing new supplier relationships and designing new equipment aimed at increasing productivity, quality and safety.

c. The 2014 Statements

338. Samarco's 2013 Sustainability Report contained the following statements made by Defendant Vescovi: "As a result of strict cost management and assurance of good margins for products with higher value added, our net income reached R\$2,731.4 million, 3.2% more than the previous year."

339. Samarco's 2013 Sustainability Report disclosed the following with respect to cost controls:

The year 2013 was marked by positive economic and financial results for Samarco. Under the influence of a more stable economic environment, but which

was still challenging from the iron ore price volatility viewpoint, we focused on austerity in production cost management, on deliveries in accordance with the demands of the markets we serve, on monitoring of all risks associated with the business, and on protection of profit margins. As a result, we posted a 3.2% increase in profit and secured the highest sales revenue in our history.

* * *

To ensure the best financial results for Samarco, we invested mainly in two fronts: internally, the focus was on combining cost and productivity management, maintaining a strict control over business margins and profitability . . . “

340. The 2014 Offering Memorandum also disclosed the following with respect to Samarco’s cost reduction and “efficient” mining operations:

We are one of the most cost efficient producers of pellets in the world on an FOB basis according to estimates by CRU in 2013. Our advanced and efficient mining, energy generation and logistics operations have been integral to our growth and cost effectiveness, and represent key competitive advantages. For example, our innovative slurry pipelines provide us with what we believe is a best-in-class logistics cost structure.

Historically, our operations have consistently delivered high margins due to the premium prices commanded by our iron ore pellet products and our advantageous cost structure. This has provided us with flexibility to grow and to maintain the competitiveness of our products through the industry cycle. In 2013, our total cash production cost per dry metric ton of pellets, which is calculated as total production costs (including mining, concentration, transportation and pelletizing costs) excluding depreciation and amortization, divided by production volume for the relevant period, was R\$106.61 (US\$49.98) per dry metric ton and our average revenue per dry metric ton shipped of pellets and fines was R\$332.0 (US\$153.58) for the same period.

341. The 2014 Offering Memorandum disclosed the following with respect to Samarco’s capital expenditures:

Capital expenditures to maintain, develop and expand our operations are an important factor in our production capacity and are expected to have a material impact on our liquidity and funding requirements for the foreseeable future. In April 2011, our shareholders approved the P4P Project, an investment of R\$6,459.3 million (US\$3,250.9 million). Our 2014 budget approved R\$1,340.7 million (US\$595.9 million) for capital expenditure, aimed at upgrading our existing mining and processing facilities, including R\$652.2 million (US\$289.9 million) for capital expenditures related to the P4P Project, of which R\$470.3 million (US\$199.2 million) has been disbursed during the first six months of

2014.

d. The 2015 Statements

342. Regarding “Cost of Products,” Samarco’s 2014 Management Report represented that “Unit costs per tonne of pellets sold decreased by 6.5% from US \$57.11 in 2013 to US \$53.42 in 2014. This is directly linked to Samarco’s strategic goal of being uniquely positioned in the industry in terms of production costs through efforts to improve cost efficiencies.”

343. Samarco 2014 Sustainability Report made the following statements with respect to cost and capital expenditure reductions:

The combination of increased production and sales with reduction of costs contributed to good results, even in the midst of a challenging marketplace scenario. Gross revenue totaled R\$ 7,601.3 million, a hike of 5% compared to 2013 (R\$ 7,240.2 million). As for net income, in 2014 it was R\$ 2,805.5 million, 2.7% more than in the previous year.

The revenue results benefited from the increase in sales attributed to the conclusion of P4P and the gains resulting from the depreciation of Brazilian currency (average rate to the dollar of R\$ 2.6556, compared to R\$ 2.3420 in 2013), in addition to the income from the sale of surplus electric energy on the short term market, efficient contract management, and taking advantage of market opportunities.

2. Statements Made by Vale

a. The 2012 Statements

344. On December 3, 2012, Vale issued its budget CAPEX for 2013 stating that “its Board of Directors has approved the investment budget for 2013, involving capital expenditures of US \$10.1 billion for project execution and US \$5.1 billion dedicated to sustaining existing operations, as well as US \$1.1 billion for research and development (R&D) expenditures. Capital and R&D expenditures in 2012 are estimated to reach US \$17.5 billion, lower than the US \$18.0 billion for 2011, the peak expected for the foreseeable future”.

345. The same document also represented that “[w]e are now more than ever strongly committed to investing only in world-class assets, with long life, low cost, expandability and high quality output, capable of creating value through the cycles. The optimization of capital management is underpinned by relentless efforts to reduce our cost structure on a permanent basis.”

b. The 2013 Statements

346. On August 8, 2013, a Vale Second Quarter 2013 (“2Q13”) presentation (the “8/8/13 Presentation”) highlighted Vale’s “strategic priorities: Cutting operating costs and corporate expenses” and “[a]s promised, costs and expenses are ramping down.”

347. Also, in an August 8, 2013 Vale press release entitled “Delivering on the promise: Sustaining Cost Reduction,” which includes specific references to Samarco, Vale represented that “[t]his year the reduction of costs and expenses has been an important source of improvement to our financial performance.”

348. Nearly identical statements were set forth in a September 11, 2013 presentation to analysts and investor in connection with a Vale Analyst & Investor Tour.

349. On November 6, 2013, Vale issued a press release announcing its financial results for the third quarter of 2013. In the press release, which was filed with the SEC on Form 6-K, Vale stated that it was taking steps to “build a lean organization,” in part, by “minimizing operating costs and expenses.” The Company touted \$2 billion in savings, which it attributed, in significant part, to decreasing operating costs by \$1.126 billion.

350. Each quarter during the Class Period, on April 30, 2014, July 31, 2014, October 30, 2014, February 26, 2015, April 30, 2015, July 23, 2015 and October 19, 2015, Vale made nearly identical statements in press releases and SEC filings touting the company’s record cost reductions and decreases in capital expenditures.

351. On November 7, 2013, a Vale Third Quarter 2013 (“3Q13”) presentation (the “11/7/13 Presentation”) highlighted Vale’s cost cutting (*i.e.*, “Minimizing operating costs and expenses”) and “productivity growth.”

c. The 2014 Statements

352. On March 27, 2014, Vale filed with the SEC its annual report on Form 20-F for the fiscal year ended December 31, 2013 (the “2013 Form 20-F”), which includes specific references to Samarco. In the 2013 Form 20-F, Vale stated that “[w]e delivered a strong operational performance in 2013, with solid results across all of our lines of business.” Vale attributed its robust financial position to “cost-cutting efforts [and] discipline in capital expenditures[.]” Vale assured the public that “[e]ven as [Vale’s] sales volumes increased, [it] achieved substantial reductions in costs and expenses[.]”

353. Vale’s 2013 Sustainability Report, filed with the SEC on May 8, 2014 on Form 6-K, identified Vale’s “cost-cutting efforts [and] discipline in investments” as “one of [its] strengths in the market.” Vale further touted its ability to reduce costs, stating that “[i]n 2013, there was a substantial reduction in costs and expenses compared to 2012, even with increased volume of sales.”

d. The 2015 Statements

354. On March 20, 2015, Vale filed with the SEC its annual report on Form 20-F for the fiscal year ended December 31, 2014 (the “2014 Form 20-F”), which also includes specific references to Samarco. In the 2014 Form 20-F, Vale highlighted its “sound financial performance, despite the decline of commodity prices in the international market,” and attributed such strong performance to “cost-cutting efforts and discipline in capital expenditures.” The 2014 Form 20-F went on to state that “[i]n 2014, we reduced our expenses by more than US \$1.2 billion, building on the significant reduction in costs and expenses we had achieved in 2013 . . .

We reduced capital expenditures for the fourth consecutive year, from US \$14.2 billion in 2013 to US \$12.0 billion in 2014.”

3. Statements Made by the BHP Defendants

a. The 2013 Statements

355. On August 20, 2013, a BHP Billiton Year Ended 30 June 2013 presentation (the “8/20/13 Presentation”) highlighted BHP’s “attention to cost, and controlling costs. Around 18 months ago we recognised the need to take a hard line on costs, and Project Reset was initiated. Its mandate was far-reaching. We scrutinised contractor usage and rates, our maintenance activities, we scrutinised general overheads, supply agreements for consumables, we scrutinised our discretionary spend and the potential for broad-reaching productivity gains. While we haven’t, and don’t plan to provide a cost savings target, we continue to make strong progress in this critical area. As you can see, we reduced our controllable cash costs by \$2.7 billion in the 2013 financial year, an outstanding result.”

356. In the BHP Billiton 8/20/2013 presentation, BHP Billiton highlighted that “Controllable cash costs [were] reduced by US \$2.7 billion in FY13” and that “Group capital and exploration expenditure [will] decline to US \$16.2 billion in FY14.”

357. On October 22, 2013, in its “Operational Review for the Quarter Ended 30 September 2013,” BHP again highlighted its cost reductions: “We continue to build on the substantial US \$2.7 billion reduction in controllable cash costs delivered in the 2013 financial year with strong momentum maintained in the first quarter.”

358. All documents expressly make references to Samarco.

b. The 2014 Statements

359. On October 27, 2014, Defendant Wilson, acting as BHP Billiton’s President of Iron Ore, made a presentation entitled “Safely growing production while lowering costs.”

According to the presentation, “[BHP] Iron Ore business, comprising Western Australia Iron Ore (WAIO) and Samarco, has delivered exceptional returns over the last five years” and “our ore bodies underpin low cost operations.”

c. The 2015 Statements

360. BHP Billiton’s Remuneration Report, which is part of BHP Billiton’s Form 20-F, published on September 14, 2015, stated that “the Group’s interests in equity accounted investments with the most significant contribution to the Group’s net profit or net assets” include Samarco Mineração S.A.. Additionally, the Chief Executive Officer’s Report, which is also part of BHP Billiton’s Form 20-F, highlighted that “further operational productivity will stretch the capacity of existing operations to safely increase volumes at very low cost, and increased capital productivity will reduce the cost of investments”.

361. In the same 20-F, BHP also mentioned that “the Group’s concentrated effort to reduce operating costs and drive productivity improvements has realised tangible results, with a reduction in controllable costs.”

4. Reasons Why the Statements Concerning Cost and Capital Expenditure Reductions Were False and Misleading

362. The above statements regarding cost and capital expenditure reductions were materially false and misleading and omitted material information when made because, among other things, Defendants knew or recklessly disregarded that the purported cost cutting and reduction in capital expenditures were due, in part, to the failure to expend the capital measures to ensure the safety of the mining operations, including the Fundão dam. As detailed above in ¶¶ ___, in an effort to reduce costs, Defendants increased the size and elevation of the already unstable Fundão dam rather than expend the capital to build additional tailings storage facilities. Moreover, numerous recommendations from experts to reinforce the Fundão dam and monitor it

on a daily basis were ignored and never implemented. As explained above, BHP and Vale oversaw the implementation and completion of the P4P Project, which they financed, and Vale was also obligated contractually to construct and maintain the Fundão dam. As described in Vale's Sustainability Reports, Vale had a "management approach" over Samarco, which it exercised through its participation in committees dealing with, among other matters, finance issues. In such report, Vale stated that it "participates in strategic decision making and influences the development of rules and policies of these companies or entities, including in terms of sustainability issues."

D. Statements About the Toxicity of Tailings-Based Mudflows

1. Statements Made by Samarco

363. On November 9, 2015, four days after the Fundão dam's failure, Samarco issued a press release emphasizing that "the material [released] is inert and nontoxic."

364. On November 12, 2015, Samarco issued a press release headlined "Is the waste toxic?," with the following answer: "The waste derived from the iron ore processing is not toxic and does not present any risk to the human health since it does not contain substances that can contaminate the water, even when exposed to rain. It is basically composed of water, iron oxide particles and silica (or quartz)."

365. Samarco's answer concluded with "It is worth remembering that the materials found in the monitoring have always been present in the Doce River. With the passage of the plume, they moved and made way to the surface. Thus, some indexes are over the limit established by the legislation. The tendency is for the numbers to normalize as the plume accommodates."

366. In support of its claim that the waste was "not toxic and does not present any risk to the human health," Samarco cited experts and "[a]nalyzes performed by SGS Geosol, a

company specialized in environmental and geochemical soil analysis, attest[ing] that the reject from the Fundão Dam does not offer hazard to people, based on the material classification (ABNT 1004).”

367. As of November 13, 2015, “Samarco ha[d] put in place a water monitoring program for the ongoing analysis of the water quality of the Gualaxo do Norte, Carmo and Doce Rivers.”

368. On or around November 25, 2015, a spokeswoman for Samarco, in an emailed statement, reiterated that the tailings from its dam consist “basically” of water, iron-ore particles and quartz. New analyses that the company requested, she said, “attest that the material analyzed does not present a danger to human health.”

369. On or around November 26, 2015, Samarco issued a statement indicating that further tests carried out by SGS GEOSOL Laboratórios after the incident confirm the waste from the Fundão dam is not hazardous to human health.

2. Statements Made by Vale

370. On November 10, 2015, Vale and BHP, in a joint statement and press conference, noted that “[w]e have already provided specialists in the areas of health, safety, environment and geotechnics to Samarco and are working with them . . .”

371. Vale’s website offered the following statement: “The waste at the dam sites is inert, it has no toxic components. It is mainly composed of silica (sand) from the iron ore processing and contains no chemicals that pose a risk to health. The results of the [November 8, 2015] analysis requested by Samarco . . . attests that the waste from the Fundão Dam offers no harm to people or the environment.”

3. Statements Made by BHP

372. On November 10, 2015, Vale and BHP, in a joint statement and press conference, noted that “[w]e have already provided specialists in the areas of health, safety, environment and geotechnics to Samarco and are working with them . . . “

373. On November 19, 2016, in a press statement headlined “Tailings,” BHP stated that “The tailings that entered the Rio Doce were comprised of clay and silt material from the washing and processing of earth containing iron ore, which is naturally abundant in the region. Based on available data, the tailings are chemically stable. They will not change chemical composition in water and will behave in the environment like normal soils in the catchment . . . Results from these samples on November 14, 2015 indicate ‘that concentrations of metals obtained at these sites do not significantly differ from the results produced by CPRM in 2010.’”

4. Reasons Why the Statements Concerning the Toxicity of Tailings-Based Mudflows Were False and Misleading

374. The statements above regarding the toxicity of tailings-based mudflows were false and misleading because Defendants knew or should have known that the waste spilled from the Fundão dam contained levels of toxic substances, including arsenic, lead, aluminum, chromium, nickel, and cadmium many times higher than the legal limits. Soon after Defendants first claimed the refuse was “not dangerous,” the United Nations High Commissioner for Human Rights disclosed that, contrary to Defendants’ prior assertions, the tailings dam contained high levels of toxic chemicals, which were unleashed into the Rio Doce. Specifically, the report stated that tests had revealed levels of arsenic, lead, aluminum, chromium, nickel, and cadmium many times higher than the legal limits. Additionally, a Rio Doce Surface Water Quality Monitoring report, dated November 17, 2015, found that as of November 12, 2015 “the aluminum values still remain[ed] above the legal limit at all of the Rio Doce channel sites.” The

report also provided that “the arsenic, cadmium, lead, chromium, and nickel at the monitoring sites . . . behaved in a similar manner; showing higher levels on the date the peak of the waste plume reached the municipalities and a posterior decrease over the following days.”

375. On November 25, 2015, the WSJ published an article entitled “Brazil Dam’s Failure Flooded Region With Toxic Waste, U.N. Report Says; Samarco says its tests show mining tailings aren’t a danger to humans.” The WSJ reported that UN “findings contradicted repeated statements by the Brazilian government and the mining companies responsible for the dam that the chemicals released by the accident were harmless.” Also reported was the fact that “[a]ll three companies [Vale, BHP and Samarco] have said the tailings are harmless and consist mostly of mud and sand.”

376. On November 25, 2015, the United Nations issued a press release specifically refuting Defendants’ claims that the tailings released from the Fundão dam and the resulting mudflow were inert, benign and relatively harmless. As the United Nations reported:

New evidence shows the collapse of a tailing dam belonging to a joint venture of Vale and BHP Billiton (Samarco Mining S.A.), which released 50 million tons of iron ore waste, contained high levels of toxic heavy metals and other toxic chemicals in the river Doce. Hospitals in Mariana and Belo Horizonte, the capital city of Minas Gerais State have received several patients.

377. According to reports associated with the United Nations’ inspection, multiple tests conducted in towns on the Rio Doce confirmed that the mudflow contained dangerously high levels of toxic heavy metals including arsenic, barium and manganese.

378. This evidence was gathered and analyzed by at least two independent experts on environment and toxic waste associated with the United Nations, known as Special Rapporteurs. The Special Rapporteurs are part of what is known as the Special Procedures of the Human Rights Council. Special Procedures, the largest body of independent experts in the United Nations Human Rights system, is the general name of the Council’s independent fact-finding and

monitoring mechanisms that address either specific country situations or thematic issues in all parts of the world. Special Procedures' experts work on a voluntary basis; they are not United Nations staff and do not receive a salary for their work. According to the United Nations, they are independent from any government or organization and serve in their individual capacity.

379. Additionally, after the release of the United Nations' results, further evidence emerged that confirmed the presence of toxins in the mudflow resulting from the tailings. Multiple tests, including those conducted on behalf of IGAM, confirmed the presence of toxic heavy metals in the mudflow. In fact, even Vania Somavilla ("Somavilla"), Vale's executive director of human relations, health and safety, sustainability and energy, admitted the flow of tailings released from the dam may have upset toxic elements settled in the bed of the Rio Doce, or along its banks.

380. According to a November 27, 2015 *Wall Street Journal* article, Somavilla cited the IGAM report when stating: "In fact there was lead, arsenic – not mercury – detected in some points along the [Rio Doce] river." She further stated: "When the dam breaks and that stuff washes out the banks of the river, it could have picked up some kind of material that was already present, from the most diverse of origins, but they're all materials present in nature." As the article recounted, these statements contradicted previous denials in which Vale, BHP and Samarco all claimed that the mud unleashed by the dam break comprised water, mud, iron-oxide and sand, none of which are harmful.

E. Statements Regarding the Adequacy of Safety, Risk Management and Monitoring Protocols

1. Statements Made by Samarco

a. The 2012 Statements

381. The 2012 Offering Memorandum made the following representations with respect to Samarco's maintenance:

Our maintenance policy aims to increase the availability of our assets while reducing production costs and ensuring the quality and safety of our operations. Maintenance activities are carried out by various departments that are responsible for routine tasks, in accordance with the studies and strategies outlined by our maintenance engineering department, which consists of planning, inspection, reliability, spare parts engineering and design teams. Our maintenance engineering department also has a continuous improvement team dedicated to increasing the life cycles of spare parts, developing new supplier relationships and designing new equipment aimed at increasing productivity, quality and safety.

382. In December 2012, Samarco released a corporate video about the P4P project, which stated that "in the implementation and operation phases . . . we adopt the most modern technologies in order to meet the highest standards of the environment protections. All residues, liquid effluents and emissions to atmosphere will be treated by careful control systems. The environmental investments exceeded BRL 250 million Reais."

b. The 2013 Statements

383. Samarco's 2012 Annual Sustainability Report contained the following statements concerning risk management and monitoring practices of Samarco's mining operations:

Because of the nature of Samarco's business, we believe it is relevant to develop a risk management model that is disseminated throughout the entire Company. This way all strategic and operational aspects that are related to business risks are considered at the time we plan or conduct our activities.

Our approach to this topic is based on our Risk Policy and our Corporate Risk Management Policy. Together, these documents allow Samarco to be in tune with the best market practices and with international legislation in this regard.

We recognize and work with five risk categories: Strategic, Operational, Project, Financial and Compliance, and Health and Safety. Samarco periodically reevaluates its risks to dynamically reflect changes in the environment as felt in its business.

384. Samarco's 2012 Sustainability Report contained the following statements concerning health and safety:

[W]e recognize the negative impacts which can be created by our activities – especially those related to health and safety, environment and communities, consumption of natural resources, and generation of waste and its disposal in dams, for example. It is part of our management approach to analyze and mitigate all possible risks, inspired by the best socioenvironmental management practices on the market, through our Sustainability Model and by maintaining a transparent, ongoing dialogue with our stakeholders.

385. With respect to P4P, Samarco's 2012 Sustainability Report disclosed that “a project of this size poses significant environmental and social challenges. To adequately meet these challenges, we have been employing a management approach which integrates socioeconomic and environmental indicators to guide our action, focused on careful and compliant processes.”

386. On October 21, 2013, Samarco published an offering memorandum, offering US \$700,000,000 aggregate principal amount of 5.75% notes due 2023 (the “2013 Offering Memorandum”). The 2013 Offering Memorandum made the following representations with respect to Samarco's maintenance:

Our maintenance policy aims to increase the availability of our assets while reducing production costs and ensuring the quality and safety of our operations . . . Our P4P Project is expected to result in additional pressure on production capacity at our current processing facilities and a need for increased maintenance of our production equipment. Accordingly, we are likely to increase our dependence on external contractors for maintenance in the future.

c. The 2014 Statements

387. In Samarco's 2013 Management Report, published on February 26, 2014, Health and Safety Management was addressed as follows:

Our Health and Safety Management System is based on OHSAS 18.001 requirements, industry best practice and shareholder requirements. To engage senior management in continual improvement of health and safety processes, the System implemented a Central Health & Safety Committee, Daily Health & Safety Talks, periodic general manager meetings, a Leadership Development Program and operations committees, which meet on a monthly basis. Notable actions around the environmental pillar include training, accident prevention campaigns and safe behavior programs such as Daily Health & Safety Meetings, Safe Work Watch programs and mentoring programs. On the systems front, we improved controls to reduce our Risk Factor, a management indicator calculated for all operational activities, and for which we have set a reduction goal of 10% per year. Our primary approach to achieving this goal is improving our management of risks considered critical. We currently have 18 critical risks identified in a number of areas, which are mitigated through management actions and regular inspections. Every year, we invest more than R\$10 million to keep these risks in check. As a result, we achieved a Risk Factor reduction of 11.5% in 2013.

388. Samarco's 2013 Management Report addressed Risk Management: "Risk management is another priority. We have developed compliance handbooks for key functions of the business, such as Environment, Marketing & Sales and Human Resources, and have also reviewed our critical risks to evaluate our ability to respond." More specifically, Samarco reported:

We recognize that proper management of any risks potentially affecting our business model is crucial to achieving our Vision 2022 [to double our value]. In 2012 we set up a General Management – Risks, Internal Controls and Compliance function to review, update and propose new categories and levels of risk for both internal and external aspects potentially affecting our strategy and operations. Risk management guidelines and methodology are set out in our Risk Management Policy statement and our Corporate Risk Management Handbook, which are based on best practice adopted in our industry and by our shareholders.

Our risk identification and review process covers a range of issues relating to management of the resources that society allows us to use, rendering sustainability, including environmental impact, health and safety and legal and financial matters. We classify risk according to its nature and criticality. We currently use five categories: Strategic, Operational, Project, Financial & Compliance and Health & Safety risk.

389. Samarco's 2013 Management Report also disclosed the following:

We perform annual reviews involving our functions and management to identify material – or critical – risks within these categories and evaluate their severity and likelihood of occurring . . . In total, we addressed 18 risks considered material and involving mission-critical aspects such as Switch gear rooms, tailings ponds and port facilities.

As another improvement in 2013, we developed a crisis prevention and management system including business continuity plans addressing our most material risks and theoretical and practical response drills. These drills were designed to assess our readiness and procedures for managing events with a potential to disrupt our operations.

Throughout the year, we also continued to develop compliance handbooks establishing subject matter-specific requirements and procedures, in line with applicable local and international regulations. Adding to the Procurement and Financial compliance handbooks prepared in 2012, this year we developed Environment, Information Technology, Human Resources and commercial handbooks.

390. On June 5, 2014, Samarco published its Annual Sustainability Report 2013 (the “2013 Sustainability Report”). The report contained the following statements made by Defendant Vescovi:

When we say we practice responsible mining, it is because we recognize the impacts caused by our activities and take responsibility for the effective management of the resources that society allows us to use, rendering sustainability a non-negotiable management requirement. We made progress in this regard in 2013, with the consolidation of our sustainability goals.

391. The 2013 Sustainability Report made the following representations with respect to Samarco’s review and evaluation of material risks:

In 2013, we worked mainly on the review and evaluation of the risks considered material - in total, we dealt with 18 items in this category, addressing items key to business continuity, such as . . . dams . . . To involve different areas in the mapping, 12 risk assessment seminars were held, which were attended by more than 140 employees and in which we reviewed controls and proposed improvements and action plans. All of the work was compiled, validated by management and by the Board, and then submitted to the shareholders.

392. The 2013 Sustainability Report contained the following additional representations: “Through seamless operations that make it possible to generate the lowest possible environmental impact with greatest operational safety and efficiency, Samarco maintains control over all its iron ore pellet production process stages - from mining to processing, pelletizing, and shipping.”

393. The 2013 Sustainability Report also disclosed the following with respect to health and safety:

The steps taken to identify and evaluate risks include different issues related to Samarco’s financial and environmental sustainability, such as health and safety, environmental impacts . . . Samarco periodically reassesses its risks to ensure management practices capable of addressing changes in the business environment.

* * *

Life is a non-negotiable priority to the company, as demonstrated by its projects and initiatives to promote a healthier and safer work environment.

Valuing life above all else is a non-negotiable matter for the activities at Samarco. All of our actions in the occupational health and safety area are guided by our Respect for people value, both within and outside of the Company’s operations. Based on requirements set forth under the international OHSAS 18001 standard, on good industry practices and on our shareholders’ guidelines, our Health and Safety Management System is the path through which we have achieved positive results in promoting safe behavior, in ensuring risk control, and in maintaining low accident rates.

Three pillars are at the heart of our performance with regard to health and safety: Leadership, Behavior and Systems. To us, having engaged leaders, an organized control and monitoring structure, and a workforce aware of the importance of the safe behavior culture is the way to achieve the results we desire. We make sure the topic is addressed by senior management through the Central Health and Safety Committee, which includes the participation of the Executive Board, the Health and Safety area, and other general departments. In parallel, we have operational committees that meet monthly, commissions, events on accident prevention and various projects - such as the Sponsor and Safe Work Observation Program.

* * *

Each year we have invested in initiatives and process improvements to further reduce our injury rates.

394. Samarco's 2013 Sustainability Report boasted the use of its management groups to share the company's purported "good practices": "Through the Health and Safety Operational Committees (OHS), the Internal Accident Prevention Commission (CIPA), in Ubu (ES), and the Internal Commission for Accident Prevention in Mining (Cipamin), in Germano (MG), 100% of our employees and permanent contractors are represented in groups that deal with safety. Each year, these groups organize the Internal Accident Prevention Week (Sipat) at each of the units, during which we schedule a series of activities aimed at heightening awareness and at sharing good practices."

395. Samarco's 2013 Sustainability Report also disclosed the following with respect to investments in health and safety: "In addition to capital input for the P4P, in 2013 Samarco maintained a series of investments in projects to ensure operation continuity, optimize existing activities, and support the business. A total of R\$520.9 million were invested, spread among areas such as the environment, health and safety, and infrastructure . . . "

396. Samarco's 2013 Sustainability Report made the following additional representations: "We use state-of-the-art technology and equipment in our projects to mitigate social and environmental impacts."

397. Samarco's 2013 Sustainability Report made the following representations with respect to its emergency plan: "In case of incidents at our facilities, employees, contractors and visitors can mobilize Samarco Emergency. This is a channel available at all company units in Brazil, which answers questions, logs cases, and sets emergency response into action. Its structure has a team specialized in emergency care and about 200 trained volunteer firefighters."

398. On September 26, 2014, Samarco published an offering memorandum, offering US \$500,000,000 aggregate principal amount of 5.375% notes due 2024 (“the 2014 Offering Memorandum”). The 2014 Offering Memorandum made the following representations with respect to Samarco’s maintenance: “Our maintenance policy aims to increase the availability of our assets while reducing production costs and ensuring the quality and safety of our operations.”

d. The 2015 Statements

399. Regarding Risk Management, Samarco’s 2014 Management Report reported:

At Samarco we monitor, analyse and mitigate the impacts of risks potentially affecting our operations and business strategy. Our current model, described in our Risk Management Policy, incorporates industry best practice and guidance from our shareholders.

We classify risk according to its nature and criticality. Five categories are currently used: Strategic, Operational, Project, Financial & Compliance and Health & Safety risk.

We perform annual reviews involving our functions and management to identify material – or critical – risks within these categories and evaluate their severity and likelihood of occurring.

400. The 2014 Sustainability Report made the following representations with respect to Samarco’s risk management:

At Samarco, we consider risk management a basic requirement for fulfilling our business plans. In order to achieve our 2022 Vision and maintain the solidness of our results and our contributions to Brazilian society, we are investing in a system of internal risk management based on market benchmarks, international laws and the practices of our shareholders.

As outlined in our Policy for Risk Management and in the Manual of Corporate Risk Management, our model allows us to monitor, analyze and control the impacts of the main externalities which have the capacity to affect the future of our business.

The risks are classified according to their nature – such as market environment, legal aspects, health and safety and environmental impact – and also with regard to their level of criticality/materiality, considering essential aspects for the long life of our business. We are currently working with five categories: strategic, operational, project, financial/compliance, and health and safety.

Samarco reevaluates its risks every year, so that it can keep an eye on any changes in the environment perceived by its business, whether inside the Company (projects, strategies, results, etc.) or outside it (market, macroeconomic trends, etc.). The mapping is based on the projection and simulation of scenarios, in a task which involves the general manager of the given area as well as the technical areas of the Company.

401. The 2014 Sustainability Report made the following representations with respect to Samarco's health and safety:

For Samarco, valuing life is a non-negotiable requirement. As a result of our respect for people, we have the Health and Safety Management System in place, which allows the identification of risks, implementation of control measures, mapping of improvements and promotion of safe behavior among employees and contractors, aiming at the prevention of occupational accidents and diseases.

The requirements of international standard OHSAS 18001, the best practices of our sector and the guidelines of our shareholders are the main references for development of our system, based on the pillars of Leadership, Behavior and System.

402. The 2014 Sustainability Report boasted "the key to improving results" was:

The combination of engaged leaderships, safe behavior culture in all activities and risk control systems is the key to improving our results. The theme is present in top management with the Health and Safety Central Committee, consisting of the Executive Board, the Occupational Health and Safety area, and other general managers. Moreover, operational committees are in place, as well as events and projects focused on the control of external facts.

403. Samarco's 2014 Sustainability Report made the following representations with respect to its Emergency Action Plan for dams:

From the perspective of safety of our operations, we have the Emergency Action Plan (PAE) of dams, which addresses the operation of the tailings disposal structures and possible malfunctions or emergencies.

Based on this document that meets the legal requirements on dam management, in 2014 we implemented a total of 1,356 hours of training with employees directly or indirectly involved in the activities.

2. Statements Made by Vale

a. The 2013 Statements

404. Vale's 2012 Sustainability Report, published in April 2013, which comprises "affiliates in which Vale owns 20% to 50% of the voting capital, either directly or indirectly, and companies or entities over which Vale exercises shared control," expressly mentioning Samarco, contained the following statements regarding risk management:

One of the procedures adopted is a set of corporate instructions related to risk management, which has the aim of presenting a system for analyzing hazards and their effects on different phases of the life cycle of our projects, in order to identify, evaluate, control, minimize and prevent risks in processes, activities, services and products, and their consequences, through tools appropriate to each scenario.

405. Vale's 2012 Sustainability Report also disclosed its Risk Management corporate structure in order to "guarantee that total risk levels remain aligned with the principles defined by the Board of Directors and the Executive Board":

Vale's risk management is divided into two major groups. One of them is the analysis and evaluation of risks associated with business goals, a broad, multidisciplinary vision known as Enterprise Risk Management (ERM). In the other group, techniques for risk analysis are more specific, in order to be comprehensive and identify, in detail, potential risk situations.

In all cases, risk management should be based on information that periodically and systematically portrays risks and allows, through effective action, them to be minimized when possible or at least kept stable. For this reason, processes run seamlessly, with a clear definition of roles and responsibilities.

b. The 2014 Statements

406. On March 27, 2014, Vale filed with the SEC its annual report on Form 20-F for the fiscal year ended December 31, 2013, which includes specific references to Samarco. In the 2013 Form 20-F, Vale represented that it has a "relentless focus on health and safety," as "[h]ealth and safety [are] . . . critical to [its] longterm competitiveness." Vale further stated that "[w]e remain focused on achieving a record of zero harm in our operations." Accordingly, Vale

has “health, safety and environmental standards and risk management systems and processes in place to mitigate the risk of” environmental, health, and safety incidents. Vale emphasized that it “mitigate[s] operational risk with new controls and improvement of existing ones,” and “[a]s a result, the Company seeks to have a clear view of its major risks, the cost-benefit on mitigation plans and the controls in place to monitor the impact of operational risk closely”

407. In April 2014, Vale publicly released its 2013 Sustainability Report, which comprises companies that Vale manages, including Samarco. In the report, Vale assured investors that Vale “implements actions and measures to prevent, control or compensate for [environmental] impacts,” and that it has “policies, systematic requirements and procedures designed to prevent and minimize risks and protect lives.” Vale represented that the company has developed “technical and operational procedures, control devices, qualified teams, specialist consultancies and period audits in order to identify, control and minimize the risks of its operations, and maintain tolerable levels[.]” The report also stated that Vale’s “[o]perations are planned and conducted so as to cause the least possible environmental impact[.]” Addressing iron operations specifically, Vale represented that their “commitment to environmental and social issues is also reflected in the way [it] manage[s] specific kinds of waste in the production process.” In explaining that iron ore waste is disposed of in tailings dams, Vale acknowledged the risks of these structures and reassured investors that Vale takes all steps necessary to “ensure that such structures are stable in order to control the risks of impacts.” Vale also represented that it has “invested in processes, systems and tools for the automation of dams monitoring[.]” “Vale dams are constructed and operated following strict safety standards and audited periodically to monitor and reduce all potential risks, including structural failures.”

c. The 2015 Statements

408. Vale made similar statements in Vale's annual report for the fiscal year ended December 31, 2014, which was filed with the SEC on March 20, 2015 on Form 20-F (the "2014 Form 20-F") and also included specific references to Samarco. In the 2014 Form 20-F, Vale represented that it had "health, safety and environmental standards and risk management programs and procedures in place to mitigate risk of environmental, health, and safety incidents."

3. Statements Made by the BHP Defendants

a. The 2013 Statements

409. On September 25, 2013, BHP Billiton issued its 2013 Annual Report, which made specific references to Samarco. BHP Billiton made the following representations with respect to "Keeping our people and operations safe": "The safety and health of our people is core to every aspect of our business . . . This is reflected in the processes and controls we have in place throughout our organization."

410. With respect to the company's "Approach to risk management," BHP Billiton represented that "We believe that the identification and management of risk is central to achieving our corporate purpose of creating long-term shareholder value. Risk will manifest itself in many forms and has the potential to impact our health and safety."

411. Regarding "Identifying and managing our material risks," BHP Billiton stated that "We identify risks we consider material to our organisation and take into consideration the potential health, safety, environmental, social, reputational, legal and financial impacts. The severity of any particular risk is assessed according to the degree of harm, injury or loss from the most severe impact associated with a specific risk."

412. In its 2013 Annual Report, BHP Billiton also represented that "[d]uring FY2013, we increased our focus on assessing the effectiveness of controls for material risks, which

required us to assess whether the critical controls were being deployed as designed and to the standard required. To monitor the effectiveness of these critical controls, they are established and then tracked through business systems, such as ISAP and internal audit processes. The ability to monitor the effectiveness of critical controls prior to a potential event occurring provides the organisation with a leading indicator for the control of these risks.”

413. In its 2013 Annual Report, BHP Billiton made the following representations regarding “Governance and sustainability”:

The Sustainability Committee of the Board assists the Board in oversight of health, safety, environment and community (HSEC) matters. This includes overseeing areas relating to HSEC risk, compliance with applicable legal and regulatory requirements, and overall HSEC performance of the Group. More specifically, management is accountable for the design and implementation of sustainability-related processes and performance necessary to comply with our suite of HSEC Group Level Documents (GLDs). GLDs describe the mandatory minimum performance requirements and accountabilities for definitive business obligations, processes, functions and activities across BHP Billiton.

414. Also on September 25, 2013, BHP issued its 2013 Sustainability Report, which also made specific references to Samarco, and which elaborated on safety processes and critical controls, managing material risks, compliance, monitoring and emergency management:

- The safety and health of our people is core to every aspect of our business. Having our people return home safe and well at the end of every working day and enabling them to end their working life fit and healthy are central to everything we do. This is reflected in the processes and controls we have in place throughout our organisation.
- The Sustainability Committee of the Board assists the Board in oversight of health, safety, environment and community (HSEC) matters. This includes overseeing areas relating to HSEC risk, compliance with applicable legal and regulatory requirements, and overall HSEC performance of the Group.
- Keeping our people and operations safe. We are focused on identifying and managing our material risks to protect our people and improve the safety of our operations.

415. BHP’s 2013 Sustainability Report also disclosed the following:

- Managing our safety risks. We remain vigilant in our focus on material safety risks, ensuring we have the appropriate controls in place to address these risks and that our people are appropriately trained. We focus on improving our workplaces, using the recognized hierarchy of controls and work practices to minimize the reliance on personal protective equipment (PPE), which we provide to employees and contractors as required.
- Our operations are also required to have systems in place to identify, manage and effectively respond to foreseeable crises and emergencies. Collectively, these requirements are designed to enable our operations to safely return to full function as soon as possible.
- Critical controls are identified for material HSEC risks and must be implemented and managed so that material risks are well controlled. To monitor the effectiveness of these critical controls, they are established and then tracked through business systems, such as ISA P and internal audit processes. The ability to monitor the effectiveness of critical controls prior to a potential event occurring provides the organization with a leading indicator for the control of these risks.

b. The 2014 Statements

416. In the 2014 Form 20-F, filed with the SEC on September 25, 2014, which made specific references to Samarco, BHP Billiton represented that it had “appropriate controls in place” to manage and eliminate risks and crises. Under the heading “Health and safety,” the Company stated, in pertinent part, as follows:

While eliminating hazards through engineering or physical controls has a strong place in safety management, we understand it is only part of the solution.

Our operations are required to have systems in place to identify and effectively manage foreseeable crises and emergencies. This ensures our operations can deal with potential causalities, to limit harm and to safely return to full function as soon as possible.

Across our business, we undertake annual assessments to verify that critical controls are effective in managing each material risk. During FY2014, we maintained this focus, which included assessing whether the critical controls were being deployed as designed and to the standard required.

c. The 2015 Statements

417. In the 2015 Sustainability Report, which included specific references to Samarco, BHP stated that “the identification and management of risk are central to achieving our corporate

purpose” since “risk has the potential to impact our health and safety, environment, community, reputation, regulatory, market and financial performance and thereby the achievement of our corporate purpose.” Accordingly, BHP represented that the company “risks are viewed and managed on a Group-wide basis. The natural diversification in our portfolio of commodities, geographies, currencies, assets and liabilities is a key element in our risk management approach.”

418. BHP also made the following representations with respect to risk management:

Risk issues are identified, analysed and assessed in a consistent manner. Performance requirements exist for the identification, assessment, control and monitoring of material risk issues that could threaten our corporate purpose and business plans. These include that:

- The potential for impacts on the achievement of our corporate purpose and business plans is identified through risk assessments using approved materiality and tolerability criteria. The severity of any risk event is assessed according to a matrix that describes the degree of harm, injury or loss from the most severe impact associated with that risk event, assuming reasonable effectiveness of controls.
- A risk assessment (risk identification, risk analysis, including likelihood and impact assessment and risk evaluation) is conducted for material risk issues.
- Risk controls are designed, implemented, operated and assessed to produce a residual risk that is tolerable. Performance standards are established for critical controls over material risks with supporting verification processes.

419. Additionally, BHP Billiton represented in the 2015 Form 20-F that it had strengthened its evaluation and implementation of safety protocols, referencing a “Company-level safety intervention” implemented by the highest levels of management, as follows:

As part of our constant focus to eliminate fatal and other serious incidents, a Company-level safety intervention was initiated in FY2015. The safety intervention was launched across our business through a variety of methods, including workshops, team talks and surveys. Feedback was presented at our senior leaders’ meeting in July 2015, identifying the key controls, programs, systems, processes and tools currently in place that require improvement and Company-wide adoption through focused leadership.

4. Reasons Why the Statements Concerning the Adequacy of Safety, Risk Management and Monitoring Protocols Were False and Misleading

420. Defendants' statements above regarding the adequacy of safety, risk management and monitoring protocols were demonstrably false and misleading because, among other things, as it relates to the Fundão dam and Samarco's mining operations, Defendants failed to implement appropriate safety, risk management and monitoring protocols, focusing instead on increased production, dividends, and austerity measures at the expense of safety, as evidenced by:

- The Fundão dam had been plagued by problems from the very beginning, including structural problems that caused inadequate drainage, which ultimately led to its catastrophic collapse because they were either ignored or improperly addressed (see, *e.g.*, ¶¶ 153 to 171);
- Defendants ignored repeated warnings about the dangerous condition of the Fundão dam, and refused to follow numerous recommendations that would have assured the safety and stability of the dam (see, *e.g.*, ¶¶ 172 to 202);
- Production was dramatically increased without the appropriate management of tailings storage facilities needed to store the proportional increase in wastes (see, *e.g.*, ¶¶ 102 to 109);
- Defendants expanded the Fundão dam despite the many warnings of its instability and dangerous condition (see, *e.g.*, ¶¶ 160 to 162, 176, 196 to 198, and 205);
- There was no emergency action plan for the Fundão dam; there were no alarms or sirens to warn people in the surrounding communities in the event of an emergency; there was no real training for dam employees, and no effort to involve the community in developing a plan to respond to an emergency (see, *e.g.*, ¶¶ 217 to 223);
- Defendants failed to properly maintain and construct the Fundão dam (see, *e.g.*, ¶¶ 143, 154, 184, 185, and 209 to 211); and
- Vale continued to deposit waste in the dam, and an increase of its size was authorized, even after sensors used to monitor the dam's stability had indicated "emergency" levels of pressure and stress (see, *e.g.*, ¶¶ 135 to 152).

F. Statements Regarding the Commitment to Health and Safety

1. Statements Made by Samarco

a. The 2013 Statements

421. The 2012 Sustainability Report stated that “[p]romoting a safe work environment that values the quality of life is a priority to Samarco. This commitment, which is one of the core elements in our Value in relation to the Respect for People, is put into practice by a system based on international standards, through which we have achieved excellent results regarding the prevention of accidents and the promotion of occupational health.”

422. Samarco’s 2012 Sustainability Report made the following representations with respect to its relation with the surrounding communities:

Measuring and managing all the advances and opportunities for improvement in community relations is a priority for Samarco. For this purpose, we have methodologies structured to accompany social, economic and environmental impacts of our activities, as well as an exclusive channel to strengthen our ties with the communities surrounding our operations and to respond to their needs.

b. The 2014 Statements

423. In Samarco’s 2013 Management Report, defendant Vescovi spoke directly to health and safety: “[r]espect for life [is] an uncompromising value at Samarco.”

424. Samarco’s 2013 Management Report highlighted health and safety:

Respect for people, a core value at Samarco, is the basis of and non-negotiable requirement for ensuring the integrity of employees and contractors across our operations . . . our health and safety programs became even more relevant in 2013, a year that saw the peak of the Fourth Pellet Plant (P4P) construction project and improvement in specific risk management practices.

425. Samarco’s 2013 Sustainability Report represented with respect to “Health and safety” that “life is a non-negotiable priority to the company” and “[v]aluing life above all else is a non-negotiable matter for the activities at Samarco. All of our actions in the occupational

health and safety area are guided by our Respect for people value, both within and outside of the Company's operations."

426. Samarco's 2013 Sustainability Report also represented the following: "We value life above any results and material goods. We respect the right to individuality, without discrimination of any kind, and honor our responsibility for the well-being of people and society, and for environmental protection, through the correct use of the resources necessary to our activities."

c. The 2015 Statements

427. In Samarco's 2014 Management Report, defendant Vescovi stated that "Respect for people is one of our core values."

428. Samarco's 2014 Management Report also highlighted health and safety:

Respect for people is one of our core values. We have policies and practices in place to protect the integrity of our employees and contractors based on three pillars – Leadership, Behaviour and Systems.

429. Samarco's 2014 Sustainability Report contained the following statement by Defendant Vescovi: "Throughout Samarco's history, we have stood together with society, particularly with the communities that lie within the areas of direct influence of our units, and, with transparent dialogue, we have obtained the *social license* to operate—one of the main pillars of our Sustainability Model . . . The Fourth Pellet Plant Project [P4P] is a good example of how we are able to promote the local development, both in Minas Gerais and Espírito Santo."

430. Samarco's 2014 Sustainability Report also represented that "[f]or Samarco, valuing life is a non-negotiable requirement" and stated the following: "We value life above any results and material goods. We respect the right to individuality, without discrimination of any kind, and honor our responsibility for the well-being of people and society, and for environmental protection, through the correct use of the resources necessary to our activities."

2. Statements Made by Vale

a. The 2013 Statements

431. Vale's 2012 Sustainability Report, published in April 2013, which comprises Samarco, stated that the company revised its Health and Safety Management Manual "to establish a health and safety management model for Vale's capital projects in compliance with Health and Safety Systemic Requirements".

432. According to Vale's 2012 Sustainability Report, "[t]he manual applies to all of Vale's capital projects and sets out the conditions to be adopted in the projects where Vale is responsible for the entire life cycle, or those where, through shareholders' agreements, the company is responsible for managing health and safety."

433. On December 2, 2013, Vale held a conference with analysts and investors to discuss the company's earnings and operations. During the conference, held in New York City, Vale made a presentation that demonstrated Vale's commitment to safety and environmental responsibility. Specifically, the slides used during the presentation, and filed with the SEC on Form 6-K, emphasized Vale's "culture of genuine care delivering operational excellence," the "implementation of the health and safety management system," and Vale's focus on "[r]isk reduction through technical improvements." The slides also assured investors that Vale would focus on "[s]afety, sustainability and [the] environment."

b. The 2014 Statements

434. In April 2014, Vale publicly released its 2013 Sustainability Report, which made specific references to Samarco. The report was referenced in a press release that was filed with the SEC on May 8, 2014 on Form 6-K. In the report, Vale reaffirmed its commitment to "focusing on health and safety . . . building a positive legacy for communities close to areas where we operate, and adopting best practices in social and environmental management[.]"

c. The 2015 Statements

435. Vale's 2014 Sustainability Report, published on April 2015, which once again expressly considered the "management approach [over Samarco] in terms of sustainability" contained nearly identical statements as those made in Vale's 2013 Sustainability Report.

3. Statements Made by the BHP Defendants

a. The 2013 Statements

436. On August 20, 2013, BHP issued a press release stating that "Safety is a core value for BHP Billiton."

437. On September 25, 2013, BHP Billiton issued its 2013 Annual Report, which included specific references to Samarco and made the following statements regarding "Sustainability, putting health and safety first":

- Our BHP Billiton Charter value of Sustainability reflects our priority of putting health and safety first, being environmentally responsible and supporting our communities.
- Sustainable development is core to our strategy; we integrate health, safety, environmental, social and economic factors into our key decision-making.
- The sustainability dimensions that we report on include the health and safety of our people; governance and risk management processes; how we contribute to improved standards of living and self-sustaining communities; our impact on the environment and approach to resource conservation and biodiversity; and how we ensure the broader economic contributions of our operations benefit the regions in which we operate.

b. The 2014 Statements

438. On September 25, 2014, BHP Billiton publicly filed its 2014 Form 20-F, which included specific references to Samarco. In describing its "values" in the 2014 Form 20-F, the company emphasized its concentration on ensuring the safety of its mining operations and the surrounding areas in which it operates, representing, in pertinent part, as follows:

In pursuing our strategy through all stages of the economic and commodity cycles, we are guided by Our BHP Billiton Charter values of Sustainability, Integrity, Respect, Performance, Simplicity and Accountability.

Our overriding commitment is to ensuring the safety of our people, and respecting our environment and the communities in which we work. This commitment informs everything we do and influences every aspect of our work.

439. Separately, the company represented in the 2014 Form 20-F that its “approach to sustainability reflects our priority to put health and safety first, be environmentally responsible and provide support to our host communities.”

440. In an October 27, 2014 BHP Billiton presentation (the “10/27/14 Presentation”), filed as an attachment to Form 6-K with the SEC on October 28, 2014, safety was highlighted as a “key theme,” in particular, “Safety is paramount and “[w]e value safe and sustainable operations above all else[.]”

441. In a November 24, 2014 BHP Billiton presentation, filed as an attachment to Form 6-K with the SEC on the same date, BHP identified safety as a “key theme,” in particular: “Safety is paramount[.]” BHP “value[s] safe and sustainable operations above all else[.]”and BHP “ha[s] a strong and stable safety performance record underpinned by our focused approach to managing material risks[.]”

c. The 2015 Statements

442. A March 10, 2015 BHP Billiton presentation entitled “Safely delivering exceptional returns” for BHP’s iron ore business, filed as an attachment to Form 6-K with the SEC on the same day, stated: “We value safe and sustainable operations above all else[.]”

443. On September 23, 2015, BHP Billiton filed the 2015 Form 20-F, which made specific references to Samarco and reiterated many of the same statements regarding safety and legal compliance contained in the 2014 Form 20-F, including the following:

- Our overriding commitment is to ensuring the safety of our people, and respecting our environment and the communities in which we work. This commitment informs everything we do and influences every aspect of our work.
- The health, safety and wellbeing of our people are central to the success of our organisation. Regardless of where our people are located or the type of work they undertake, we strive to create a working environment that is free from occupational illness or injury. Identifying and managing fatal and material risk is a critical component of our management approach. By understanding and managing our risks, we provide greater protection for our people, communities and assets.
- The health and safety of our people and of the broader communities in which we operate is central to every aspect of our business. Regardless of where our people are located, the area of the organisation in which they work, or the type of work they undertake, we strive to create an environment that is free from occupational harm.

444. The September 2015 statements, made in the context of the 2015 Form 20-F, repeated the materially false and misleading statements concerning safety and sustainability contained in prior filings and representations made during the Class Period.

445. In the BHP 2015 Sustainability Report, published on September 23, 2015, after “putting health and safety first,” BHP stated that “[t]he safety and health of our people and of the broader communities in which we operate are central ...”

4. Reasons Why Defendants’ Statements Regarding the Commitment to Health and Safety Were False and Misleading

446. Defendants’ statements above regarding the commitment to health and safety were demonstrably false and misleading because, among other things, as it relates to the Fundão dam and Samarco’s mining operations, Defendants were not focused on health and safety, and caring for health and safety was not a priority for Defendants, as evidenced by:

- The Fundão dam had been plagued by problems from the very beginning, including structural problems that caused inadequate drainage, which ultimately led to its catastrophic collapse (see, *e.g.*, ¶¶ 153 to 171)

- Defendants ignored repeated warnings about the dangerous condition of the Fundão dam, and refused to follow numerous recommendations that would have assured the safety and stability of the dam (see, *e.g.*, ¶¶ 172 to 202);
- Production was dramatically increased without appropriate management of the tailings storage facilities needed to store the proportional increase in wastes (see, *e.g.*, ¶¶ 102 to 109);
- The Fundão dam was expanded despite the many warnings of its instability and dangerous condition (see, *e.g.*, ¶¶ 160 to 162, 176, 196 to 198, and 205);
- There was no emergency action plan for the Fundão dam; there were no alarms or sirens to warn people in the surrounding communities in the event of an emergency; there was no real training for dam employees, and no effort to involve the community in developing a plan to respond to an emergency (see, *e.g.*, ¶¶ 217 to 223);
- The Fundão dam was not properly maintained and constructed (see, *e.g.*, ¶¶ 143, 154, 184, 185, and 209 to 211);
- Vale continued to deposit waste in the dam, and its size was increased, even after sensors used to monitor the dam's stability had indicated "emergency" levels of pressure and stress (see, *e.g.*, ¶¶ 135 to 152).

G. Compliance with Local Laws and Regulations

1. Statements Made by Samarco

a. The 2013 Statements

447. Samarco's 2012 Management Report made the following representations:

We intend to double Company value in 2022 and be recognized by employees, clients and society as the best in the sector. Our strategy is based on three pillars of management in which we will concentrate our efforts in order to arrive at this point.

- Compliance: respecting Brazilian and international laws and our own standards and procedures.

448. Similar statements were made in Samarco's 2012 Sustainability Report: "there is Compliance—obedience to the laws and to the policies and guidelines of Samarco."

b. The 2014 Statements

449. Samarco's 2013 Management Report contained the following statements with respect to compliance:

Compliance underpins all our practices and relations. We ensure our management conforms to regulations and Company standards through our compliance program, which was further enhanced in 2013 and includes a standing framework of compliance mechanisms, communication channels, policies and training on ethics and business conduct.

450. Regarding "Compliance with laws," Samarco's 2013 Sustainability Report represented that "The Company, controlled in equal parts by two shareholders - BHP Billiton Brasil Ltda. and Vale S.A. - has three key management pillars: Excellence in all of our practices and relationships; Compliance with laws, regulations and policies applicable to the business; and steady Growth, creating value we share with society."

451. Samarco's 2013 Sustainability Report contained the following additional statements: "To Samarco, responsible mining means not only compliance with laws and regulations, but also – and above all - the pursuit of mutual development."

452. Samarco's 2013 Sustainability Report contained the following additional representations: "We are committed to compliance with laws and respect for moral principles, striving for dignity and ethics in our relationships. We adopt an honest and transparent posture with all our stakeholders."

c. The 2015 Statements

453. Regarding Compliance, Samarco's 2014 Sustainability Report represented that that Compliance is one of Samarco's pillars of management. In addition, the following statements were also made:

We are committed to compliance with laws and respect for moral principles, striving for dignity and ethics in our relationships. We adopt an honest and transparent posture with all our stakeholders.

Through our compliance program, increasingly strengthened over the years, we invest in conformity at all Company levels and processes, through policies, training, processes, structures and control mechanisms.

2. Statements Made by Vale

a. The 2013 Statements

454. Vale 2012's Sustainability Report, published on April 2013, which comprises Samarco, is categorical: "Vale complies with legal requirements in its processes" Vale also stated in the same document that "[it] uses technical and operational procedures, control devices, qualified teams, specialist consultancies and periodic audits to identify and minimize the risks of its operations, besides remaining in compliance with legislation and other applicable requirements."

b. The 2014 Statements

455. In its 2013 Sustainability Report, published in April 2014, which made specific references to Samarco, Vale represented that "[a]ll events that threaten sustainability or that may cause a deviation from our objectives are identified, and the following types of impact are considered: health and safety, environment, reputation, social, financial and compliance with legislation."

c. The 2015 Statements

456. Vale's 2014 Sustainability Report, published in April 2015, which comprises Samarco, stated that "[m]ineral reserves are not infinite. For this reason, we prepare to close our operations via mine closure plans, which consider all of the associated technical, economic and environmental aspects. These plans permeate the entire life cycle of our projects, from the exploration phase through to decommissioning, and are developed for new projects. As well as

complying with the specific laws of each of the locations in which we operate, our mine closure actions are designed to ensure a positive legacy.”

3. Statements Made by the BHP Defendants

a. The 2013 Statements

457. In its 2013 Annual Report published on September 25, 2013, which made specific references to Samarco, BHP Billiton made the following statements regarding “Health, safety, environment and community”: “We are subject to extensive regulation surrounding the health and safety of our people and the environment. We make every effort to comply with the regulations and, where less stringent than our standards, we aim to exceed applicable legal and other requirements.”

b. The 2014 Statements

458. In its 2014 Form 20-F, filed with the SEC on September 25, 2014, which made specific references to Samarco, BHP Billiton acknowledged the importance of compliance with local laws and regulations of the communities in which its mining operations are located, and represented that those operations are compliant. Specifically, BHP represented, in pertinent part, as follows:

We operate in an industry where many of our activities are highly regulated by laws governing health, safety and the environment. We are committed to compliance with the laws and regulations of the countries in which we operate and, where applicable, to exceeding legal and other requirements which are less stringent than our own.

c. The 2015 Statements

459. In the 2015 Form 20-F, filed with the SEC on September 23, 2015, which made specific references to Samarco, BHP Billiton made a representation identical to that contained in the 2014 Form 20-F regarding the importance and status compliance with local laws and

regulations of the communities in which its mining operations are located. Specifically, BHP Billiton represented, in pertinent part, as follows:

We operate in an industry where many of our activities are highly regulated by laws governing health, safety and the environment. We are committed to compliance with the laws and regulations of the countries in which we operate and, where applicable, to exceeding legal and other requirements which are less stringent than our own.

460. In the 2015 Sustainability Report, which also included specific references to Samarco, BHP stated that it “ha[s] established processes that apply when entering or commencing new activities in high-risk countries” to ensure that “legislative compliance is maintained ...”

4. Reasons Why the Statements Concerning Compliance With Laws and Regulations Were False and Misleading

461. Defendants’ statements above regarding compliance with local laws and regulations were materially false and misleading when made because the operations at the Fundão dam did not comply with such laws or regulations. For example, in the wake of the Fundão dam collapse, Brazilian prosecutors and government officials charged that the mining operations related to the Fundão dam did not comply with dam licensing requirements or local environmental laws. Moreover, Defendants failed to disclose to the Brazilian authorities, including DNPM, that during the Class Period Vale was disposing of its tailings in the dam.

462. Indeed, news reports confirmed on November 9, 2015 that Samarco’s mining license had been suspended on or about November 6, 2015 as a result of concerns that it had not complied with required safety standards. According to Geraldo Abreu (“Abreu”), the Deputy Environmental Secretary of Minas Gerais, “[Samarco] will need to make a number of changes before we allow them to begin mining again.” Subsequently, Abreu commented that the Fundão dam would not be part of any licensing application for Samarco to recommence operations.

Indeed, according to Abreu: “The dam will not be used if the mine restarts operations, so it’s not involved in the licensing process.” Further, according to Brazilian newspaper Estado de Minas, the EAP that Samarco had in place ignored Brazilian Federal Law 12.334, which establishes Brazil’s national policy on dam safety, since September 20, 2010.

463. A criminal complaint recently filed by the Brazilian Federal Prosecutor’s Office charged Defendants with: (i) crimes pursuant to the environmental laws—pollution offense aggravated, crimes against fauna, crimes against flora, crimes against urban planning and cultural heritage, crimes against environmental management; and omission of information in the Annual Mining Report and in the Plan for Economic Exploitation; and (ii) crimes pursuant to the Brazilian Penal code—flood crime, crime of collapse, homicide, crime aggravated by the impossibility and difficulty of the victims’ defense: the failure of the Emergency Action Plan, crime aggravated by base motives, crime aggravated by cruelty, or resulting in common danger, and crime of bodily injury.

VII. LOSS CAUSATION/ECONOMIC LOSS

464. As detailed herein, Defendants engaged in a scheme to deceive the market and a course of conduct which artificially inflated the price of Samarco’s bonds and operated as a fraud or deceit on Class Period purchasers of the Samarco bonds. When Defendants’ prior misrepresentations and fraudulent conduct were disclosed and became apparent to the market, the price of the Samarco bonds fell precipitously as the artificial inflation was removed.

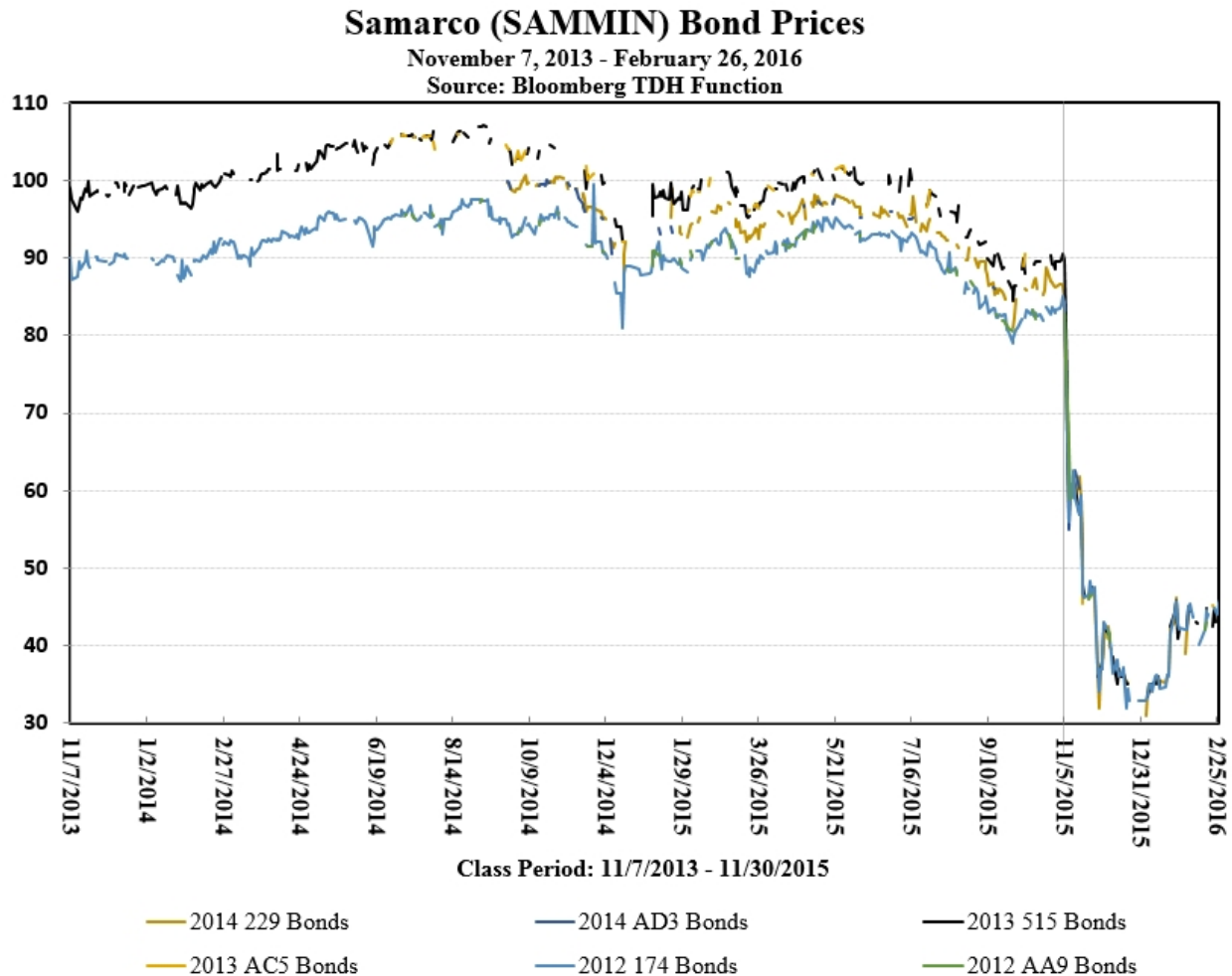
465. Within less than a month following the Fundão dam collapse, all Samarco bonds lost well over half their value. In the same period, an index of Brazilian corporate bonds

declined only 3.8%,⁵ and an index of iron ore spot prices declined 9.6%.⁶ The reported last prices of Samarco bonds before November 5, 2015, the date the Fundão dam burst, were: 86.50 (2014 AD3), 86.35 (2014 229), 90.25 (2013 AC5), 90.47 (2013 515), 83.125 (2012 AA9), and 85.10 (2012 174).⁷ The reported last prices of Samarco bonds on November 30, 2015, the final day of the Class Period, were: 37.00 (2014 AD3), 37.25 (2014 229), 34.75 (2013 AC5), 36.00 (2013 515), 36.00 (2012 AA9), and 37.00 (2012 174).

⁵ Bloomberg: BofA Merrill Lynch Brazil AAA-BB USD Emerging Markets Corporate Plus Index, November 4, 2015 to November 30, 2015.

⁶ Bloomberg: Iron Ore Spot Price Index 62% Import Fine Ore in USD, November 4, 2015 to November 30, 2015.

⁷ Three issues of Samarco bonds (2012, 2013, 2014) traded in the Class Period. All three issues had 10-year maturities. Trades in each issue, including price, were reported under either of two ISIN numbers specific to that issue. ISIN numbers for the 2012 issue are: 79586KAA9 (“2012 AA9”) and EJ4236174 (“2012 174”). ISIN numbers for the 2013 issue are: 79586KAC5 (“2013 AC5”) and EJ8974515 (“2013 515”). ISIN numbers for the 2014 issue are: 79586KAD3 (“2014 AD3”) and EK5128229 (“2014 229”). Prices cited of Samarco bonds are reported daily “last” trade prices for each ISIN from TRACE data supplied by FINRA and reported by Bloomberg (TDH function). Not all bonds trade on all dates. Unlike equities trading, there are no exchange “closing” prices in bond trading, so “last” trade prices may occur at different times of day on different dates. Corporate bond prices are expressed as a percentage of par value, with par value usually 100, *i.e.*, 100% of a bond’s \$1,000 face value. Thus, a bond price of 99.5 represents 99.5% of face value, *i.e.*, \$995 per bond.



466. As a result of their purchases of Samarco bonds during the Class Period, Plaintiff and the other Class members suffered damages.

467. On the afternoon of Thursday, November 5, 2015, the Fundão dam burst, flooding the nearby town of Bento Rodrigues with 60 million cubic meters of mud and mine waste. Samarco's operations were immediately suspended. News reports regarding the catastrophe followed some of which linked the incident to possible safety issues at Samarco. For example, in a November 5, 2015 *New York Times* article, the Brazilian prosecutor for the state of Minas Gerais Carlos Eduardo Ferreira Pinto commented: "We need rigor in determining what happened . . . No dam bursts by chance."

468. Other articles also reported on Pinto's comments, which implied a link between the dam break and Samarco, BHP and Vale's safety practices and protocols. For example, a November 6, 2015 Sydney Morning Herald article containing the same quote from prosecutor Pinto reported that "BHP chief executive Andrew Mackenzie spoke about the impact of workplace fatalities just two weeks ago at the company's annual meeting of London shareholders." As the article further reported, defendant Mackenzie stated: "We have engaged tens of thousands of our people across the company in discussions to upgrade their health and safety leadership, to make their workplaces healthier and safer, free from fatalities, serious injuries and long term health effects."

469. Early on November 6, 2015, Bloomberg carried an unconfirmed report from the Brisbane Times that the dam failure, described by BHP as "serious," had killed up to 16 people with 45 still missing. Bloomberg also reported on November 6 that the Minas Gerais state prosecutor's office was seeking damages for the affected population and would request partial seizure of Samarco's assets to guarantee an indemnity. Bloomberg reported in late-day news that Minas Gerais prosecutor Pinto had announced he would ask the state government to suspend Samarco's license to operate. Also on November 6, 2015, credit rating agency Standard and Poor's ("S&P") placed Samarco's BB+ rating on CreditWatch with negative implications. S&P reported that it could not at that time assess the full extent of damage, or the potential impact on Samarco's operations and the possible contingent liabilities. Nevertheless, S&P estimated there was at least a 50% chance for a rating downgrade "even though current ratings include some level of support from Samarco's parent Vale SA."

470. In response to the revelations on Thursday, November 5 and Friday, November 6, 2015, prices of Samarco's bonds declined sharply. On the morning of November 6 Bloomberg

reported “Samarco Mineracao [b]onds [t]umble [a]fter Brazil [m]ining [d]isaster.” After 5 pm ET that day, Bloomberg reported “Samarco’s \$1 billion in bonds due 2022 tumbled 6.7 cents to 76.7 cents on the dollar.”

11/6/2015 Friday					
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/5/2015	84.50	11/6/2015	76.00	-10.1%
2014 AD3 Bonds	11/5/2015	85.75	11/6/2015	77.56	-9.6%
2013 515 Bonds	11/5/2015	89.71	11/6/2015	81.63	-9.0%
2013 AC5 Bonds	11/3/2015	90.25	11/6/2015	82.00	-9.1%
2012 174 Bonds	11/5/2015	84.25	11/6/2015	76.25	-9.5%
2012 AA9 Bonds	11/5/2015	83.00	11/6/2015	77.09	-7.1%

471. News coverage of the dam collapse and its consequences for Samarco continued over the weekend. On Sunday, November 8, 2015, Samarco announced it would cease iron ore pellet production and shipping at its facility in Brazil’s Espirito Santo state when its inventory of ore was exhausted. The report was carried by Bloomberg on the same day.

472. On Monday, November 9, 2015, in a news release filed with the SEC early that morning as an attachment to Form 6-K, BHP provided an update on the “incident at Samarco.” The company disclosed that the Fundão dam had collapsed, that at least one fatality had been confirmed, and that, as a result of the collapse, BHP was reviewing its iron ore production guidance for fiscal year 2016. Dow Jones reported that a Deutsche Bank analyst had described the dam collapse as “catastrophic,” estimating that the cost to the companies involved could top US \$1 billion, and that the collapse would result in closure of the Samarco mine until about 2019. Also on November 9, Bloomberg reported that Samarco’s mining license had been suspended by Minas Gerais state authorities. Later the same day, Dow Jones reported that rating agency Fitch had placed Samarco on Ratings Watch Negative, opining that Samarco credit

ratings could be downgraded by one notch or more should developments result in significant suspension of production or operating licenses permanently revoked and/or severe penalties.

473. In response to this news, prices of Samarco bonds declined precipitously once again. On November 9, 2015, Bloomberg reported Samarco bond prices were falling for the second (trading) day after the mining disaster, with prices of all three issues having reached record low levels.

11/9/2015 Monday					
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/6/2015	76.00	11/9/2015	57.28	-24.6%
2014 AD3 Bonds	11/6/2015	77.56	11/9/2015	55.00	-29.1%
2013 515 Bonds	11/6/2015	81.63	11/9/2015	60.00	-26.5%
2013 AC5 Bonds	11/6/2015	82.00	11/10/2015	60.25	-26.5%
2012 174 Bonds	11/6/2015	76.25	11/9/2015	56.00	-26.6%
2012 AA9 Bonds	11/6/2015	77.09	11/9/2015	66.00	-14.4%

Italicized time spans also span another loss causation date and appear under that date as well.

474. On Friday November 13, 2015, investors learned of more aggressive actions being taken against Samarco by Brazilian authorities, resulting from the Fundão dam collapse. Brazilian Deputy Prosecutor General Sandra Cureau disclosed that authorities were preparing a criminal case against Samarco which could result in “total suspension of activities,” *i.e.*, permanent closure of the mining site where the Fundão dam burst. Bloomberg quoted the Deputy Prosecutor General as stating “It will be a punishment to serve as an example to avoid other accidents as serious as this.” She said that Samarco had been negligent in increasing the height of the dam without further studies, and for failing to have a contingency plan including an alarm system. Also on November 13, Folha reported that a Brazilian court had issued an injunction blocking BRL300 million in Samarco’s accounts to preserve funds for victims of the dam collapse.

475. Prices of most Samarco bonds declined on November 13, 2015, in response to this news.

11/13/2015 Friday					
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/12/2015	61.83	11/13/2015	59.00	-4.6%
2014 AD3 Bonds	11/10/2015	60.50	11/13/2015	62.50	3.3%
2013 515 Bonds	11/12/2015	61.50	11/13/2015	60.47	-1.7%
2013 AC5 Bonds	11/12/2015	61.00	11/13/2015	59.51	-2.4%
2012 174 Bonds	11/12/2015	62.50	11/13/2015	59.00	-5.6%
2012 AA9 Bonds	11/12/2015	62.00	11/16/2015	60.50	-2.4%

476. News that Samarco's other two tailings dams also were at risk caused prices of Samarco bonds to plummet further. Bloomberg reported mid-afternoon of November 17, 2015 that Samarco had disclosed the two additional dams were at risk of bursting. Bloomberg reported additional information on the risk to the two other Samarco dams on November 18: that investigators had found "slips" in the dams, and that the dams were being shored up on an emergency basis in projects expected to take three months to complete. Local media reported that both dams were damaged following collapse of the Fundão dam.

11/17/2015 Tuesday					
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/16/2015	61.88	11/17/2015	58.97	-4.7%
2014 AD3 Bonds	11/16/2015	60.25	11/18/2015	54.50	-9.5%
2013 515 Bonds	11/16/2015	57.00	11/17/2015	56.95	-0.1%
2013 AC5 Bonds	11/13/2015	59.51	11/17/2015	59.50	0.0%
2012 174 Bonds	11/16/2015	57.00	11/17/2015	59.47	4.3%
2012 AA9 Bonds	11/16/2015	60.50	11/23/2015	46.00	-24.0%

Italicized time spans also span another loss causation date and appear under that date as well.

477. Bloomberg also reported on November 18, 2015 that prices of Samarco bonds had dropped to a new low following news of the emergency work on the two other Samarco dams in the dam complex which included the Fundão dam.

11/18/2015 Wednesday					
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/17/2015	58.97	11/18/2015	49.00	-16.9%
2014 AD3 Bonds	11/16/2015	60.25	11/18/2015	54.50	-9.5%
2013 515 Bonds	11/17/2015	56.95	11/18/2015	51.60	-9.4%
2013 AC5 Bonds	11/17/2015	59.50	11/18/2015	49.00	-17.6%
2012 174 Bonds	11/17/2015	59.47	11/18/2015	48.25	-18.9%
2012 AA9 Bonds	11/16/2015	60.50	11/23/2015	46.00	-24.0%

Italicized time spans also span another loss causation date and appear under that date as well.

478. On November 19, 2015, Samarco bond prices reacted negatively to new information on the high cost to be paid for the Fundão dam collapse. On the morning of November 19, Dow Jones reported that Brazilian Congressman Leonardo Quintao stated that the Fundão dam breach could amount to at least BRL 10-14 billion (US \$2.66-\$3.72 billion) in cleaning costs and compensation. Although Samarco to date had agreed to set aside BRL 1 billion for clean-up, Congressman Quintao stated that after speaking with specialists, he concluded that clean-up costs more likely would be around BRL 6 billion, with additional payments to families who lost lives and property. Also on November 19, BHP announced it would commission an external investigation into causes of the Fundão dam collapse. BHP Chairman Jacques Nasser stated it would be “some time before this investigation concludes,” but promised the results would be made public. Another consequence of the Fundão dam collapse was reported November 19, 2015: a Brazilian court had demanded Samarco submit a new coastal emergency plan within 24 hours, to avoid imminent contamination of the coast of Espírito Santo

state as the tailings released by the Fundão dam collapse flowed down the Rio Doce to the Atlantic coast.

479. The last trade prices of Samarco bonds having reported prices for November 19, 2015, all declined from their last prices on November 18, 2015.

11/19/2015		Thursday			
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/18/2015	49.00	11/19/2015	46.75	-4.6%
2014 AD3 Bonds	11/18/2015	54.50	11/30/2015	37.00	-32.1%
2013 515 Bonds	11/18/2015	51.60	11/19/2015	48.00	-7.0%
2013 AC5 Bonds	11/18/2015	49.00	11/19/2015	45.50	-7.1%
2012 174 Bonds	11/18/2015	48.25	11/19/2015	46.75	-3.1%
2012 AA9 Bonds	11/16/2015	60.50	11/23/2015	46.00	-24.0%

Italicized time spans also span another loss causation date and appear under that date as well.

480. On Friday, November 27, 2015, the trading day after Thanksgiving (November 26, 2015), Vania Somavilla, Vale's executive director of human relations, health and safety, sustainability and energy, acknowledged the presence of toxic elements in the Rio Doce River – a first-of-its-kind admission that shocked the market, given the staunch prior denials by Defendants. Additionally, news broke that the Brazilian government planned to sue Vale, BHP and Samarco for approximately \$5.3 billion as a result of the Fundão dam incident. The civil suit was to be filed on Monday November 30, according to Dow Jones. Bloomberg reported in mid-afternoon November 27 that Brazil's Attorney General Luis Inacio Adams spoke with reporters after meeting with President Dilma Rousseff. Attorney General Adams stated that Samarco, Vale and BHP would face claims over damage, repairs, and indemnification, which could reach BRL 20 billion (US \$5.3 billion). The Attorney General also stated there was a request that a judge seize funds to ensure payment of the claims.

481. On Sunday November 29, 2015, Estado reported that the State Comptroller General's Office in Mariana had opened an internal investigation to determine possible irregularities in issuing licenses for Samarco to operate in Mariana. The agency was said to be reviewing the entire licensing process of the Germano mine and the standing Santarem dam.

482. Finally, on Monday, November 30, 2015, the Wall Street Journal reported that the government of Brazil had in fact filed a lawsuit on that date against Samarco, Vale, and BHP. The lawsuit demanded BRL 20.2 billion to be paid over 10 years, and the immediate deposit of BRL 2 billion. Government attorneys asked a federal judge to require as guarantee that Samarco pay 50% of its net profit or 20% of its annual revenue, whichever was greater.

483. Also on November 30, 2015, Brazilian President Dilma Rousseff placed BHP and Vale squarely within the crosshairs, publicly blaming the Samarco disaster on the "irresponsible action of a company" and adding: "We are severely punishing those responsible for this tragedy."

484. In response to this news, prices of Samarco's bonds declined precipitously. Bloomberg reported that Samarco bonds had slumped to a record low. On November 30, 2015, prices of all Samarco bonds dropped far below their last trade price on the last previous trading day.

11/30/2015		Monday			
Bond	Prior Date for which Price Reported	Price	Next Date for which Price Reported	Price	% Change
2014 229 Bonds	11/27/2015	46.00	11/30/2015	37.25	-19.0%
2014 AD3 Bonds	11/18/2015	54.50	11/30/2015	37.00	-32.1%
2013 515 Bonds	11/25/2015	47.50	11/30/2015	36.00	-24.2%
2013 AC5 Bonds	11/19/2015	45.50	11/30/2015	34.75	-23.6%
2012 174 Bonds	11/27/2015	47.50	11/30/2015	37.00	-22.1%
2012 AA9 Bonds	11/25/2015	46.50	11/30/2015	36.00	-22.6%

Italicized time spans also span another loss causation date and appear under that date as well.

485. As shown above, the timing and magnitude of the price declines in Samarco's bonds negate any inference that the loss suffered by Plaintiff and other investors was caused by changed market conditions, macroeconomic or industry factors or company-specific facts unrelated to the fraud.

VIII. ADDITIONAL SCIENTER ALLEGATIONS

A. Defendant Ricardo Vescovi de Aragão

486. In his position as Director of Operations and Sustainability, Defendant Vescovi was responsible for submitting to Samarco's Board of Directors all information regarding the operation of the dams, including the Fundão dam. In his position as Samarco's CEO, Vescovi played a leading role in the Board of Directors meetings being, for example, responsible for presenting the items on the agenda and for updating board members on compliance with the shareholders' (BHP and Vale) recommendations. In his position as a member of the Dams Committee, Vescovi had knowledge of the problems plaguing the Fundão dam.

487. Vescovi participated in all the meetings of the Operations Committee, where problems, flaws or nonconformities of the Fundão dam were discussed. These problems included: gallery problems; drainage problems; axis setback in the left abutment without a design and failure to follow the operations manual; failure to update the operations manual and the risk letter; minimum beach maintenance, with width less than 200 meters; problems associated with fixing the setback of the axis; and contamination of sandy tailing by slimes. These issues were discussed at Operations Committee meetings held on the following dates: 11/27/2011, 03/26/2012, 11/21/2012, 03/15/2013, 13/11/2013, 03/14/2014, 11/19/2014, 03/18/2015 and 10/07/2015.

488. At the 42nd meeting of Samarco's Board of Directors held on October 20, 2005, Vescovi requested the approval by the Board of the third pelletizing project (P3P). Vescovi actively participated in the process of expansion and construction of the Fundão dam.

489. At the 80th meeting of Samarco's Board of Directors held on December 12, 2009, Vescovi received the final report on the piping problems occurring at Dike 1. Vescovi, as a member of the Executive Board, recommended that the Board adopt the alternative of installing a drainage blanket to replace the bottom drains that stopped working properly. Vescovi received additional information of the problems existing at the Fundão dam at the following Samarco Board of Directors meetings: 05/12/2010 (the 85th meeting of the BoD) and 09/26/2010 (the 89th meeting of the BoD).

490. At the 99th meeting of Samarco's Board of Directors held on August 10, 2011, Vescovi was informed that tailings management was a major concern that deserved Samarco's continued attention, including: full compliance with the recommendations made by ITBR; focus on the catastrophic risks identified by the risk assessment made by ITRB, taking the necessary measures to avoid their occurrence; and periodic reports to the Board of Directors on tailings management.

491. At the 108th meeting of Samarco's Board of Directors held on August 8, 2012, Vescovi presented to the Board of Directors a study on the community Bento Rodrigues and on the risks the Fundão dam posed on that community. Vescovi was tasked with resetting the community farther from the tailings dams, but the move did not happen before the dam collapsed due to the increased volume of tailings.

492. At the 110th meeting of Samarco's Board of Directors held on April 4, 2013, Vescovi received information regarding the disposal of Samarco's tailings in the Fundão dam,

including its risks, and approved the initiatives presented, among which was continuing the axis setback in the left abutment.

493. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Vescovi received detailed information on the tailings disposal system and participated in discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Vescovi continued to implement cost containment policies at Samarco, directing its subordinates to pay "attention to production gains" and to Samarco's budget, making numerous cost reduction recommendations.

494. At the 115th meeting of Samarco's Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Vescovi continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco's General Geotechnical Management was cut.

495. At the 119th meeting of Samarco's Board of Directors held on December 10, 2014, Vescovi learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining the dam's stability. Among the actions Samarco failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Vescovi was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1's left abutment and the failure to maintain minimum beaches with width between dam crest and water at a distance of 200 meters or more. Vescovi passively witnessed the Board's decision to take note of the information and the agreement that, after safety, cost reduction should be the main focus of management in 2015.

496. At the 120th meeting of Samarco's Board of Directors held on April 15, 2015, Vescovi learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Vescovi received documentary evidence showing the setback in Dike 1's left abutment, which violated the Fundão project and Samarco's manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board of Directors. Vescovi also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam's stability.

497. At the 121st meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

498. Vescovi also attended the meetings of the Samarco Dams Committee held on November 4, 2009, April 16, 2010, May 30, 2011, February 28, 2012, September 25, 2012, December 14, 2012, June 11, 2013, and October 26, 2013. Vescovi was responsible for many decisions regarding the operation of the dam, including: depositing slimes mixed with sand in the Dike 1A reservoir; the decision not to follow the ITRB's recommendation to hire Pimenta de Avila to supervise the work of the Geotechnical Management, whose team was considered inexperienced and lacking the expertise needed to handle the complexity of the Fundão dam; and continuing operations despite the many problems experienced by the Fundão dam.

499. Vescovi frequently participated in the ITRB meetings, where the consultants reported problems, flaws, and nonconformities related to the Fundão dam.

500. Vescovi participated, on a monthly basis, in presentations made at Samarco's Executive Board's meetings regarding risks related to critical failures in the process of dam implementation and in the dam operation process, and had access to all the risks identified and all the action plans that were not properly or timely implemented.

501. According to the Brazilian federal prosecutors' office, the Brazilian police analyzed an exchange of e-mails and chats obtained pursuant to a search and seizure carried out on Samarco's data center, which show that Vescovi possessed detailed information concerning the Fundão operations.

502. As the CEO of Samarco, Vescovi was directly responsible for ensuring that the information contained in the Economic Mining Plans and in Samarco's Annual Mining Reports during the years of 2012, 2013, 2014 and 2015 was complete and accurate. Despite knowing that Vale was depositing tailing at the Fundão dam from Vale's mine Alegria, Vescovi failed to report that fact, which impeded the proper supervision of Samarco's mining activities by the relevant Brazilian authorities, including DNPM.

B. Defendant Kleber Luiz de Mendonça Terra

503. Defendant Terra was Samarco's Operations and Infrastructure Officer from 2012 to the date of the Fundão dam collapse. Terra participated in all discussions and deliberations of Samarco's Board of Directors occurring since August 8, 2012, from the 108th meeting to the 121st meeting. As Samarco's Chief Operating Officer, Terra was responsible for submitting to the Board of Directors all data and details on the operation of the dams.

504. Terra participated in the meetings of Samarco's Subcommittee on Operational Performance, held on June 13, 2014, August 7, 2014, October 21, 2014, February 10, 2015, May 12, 2015 and June 19, 2015, where the problems, flaws and nonconformities related to the Fundão dam were discussed. Similar issues were discussed at meetings of Samarco's Operations

Committee, in which Terra participated on March 26, 2012, November 21, 2012, March 15, 2013, November 13, 2013, March 14, 2014, November 19, 2014, March 18, 2015 and July 10, 2015. The issues discussed included: gallery problems; drainage problems; axis setback in the left abutment without a design and in violation of Samarco's operations manual; failure to update the operations manual and the risk letter; violations of minimum beach maintenance; insufficient progress on fixing the axis setback; and contamination of sandy tailings by slimes.

505. During his tenure as Operations Officer, member of the Samarco's Operations Committee, member of the Operational Performance Committee and member of the Dams Committee, Terra had knowledge of the risks, failures and nonconformities at the Fundão dam.

506. At the 108th meeting of Samarco's Board of Directors held on August 8, 2012, Terra presented to the Board a study on the risks the Fundão dam posed to the sub-district Bento Rodrigues, and was entrusted with the task of resetting the communities located near the tailings dams. Terra learned from Germano Silva Lopes (Samarco's former Geotechnics General Manager) that "if we consider the hypothetical rupture of the Santarem's Dam⁸, [tailing wave] reaches Bento [community]." Still, the resetting of the community did not take place and the volume of tailings at the Fundão dam steadily increased.

507. At the 110th meeting of Samarco's Board of Directors held on April 4, 2013, Terra provided information on the disposal of Samarco's tailings in the Fundão dam, on the risks associated with the dam and on actions taken at the dam. Terra approved the initiatives presented, among which was the continuity of works in the axis setback at the left abutment.

508. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Terra provided detailed information on the tailings disposal system and participated in

⁸ Santarém is a water dam owned by Samarco, located downstream of the Fundão dam.

discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Terra directed its subordinates to pay “attention to production gains” and to Samarco’s budget, and to implement numerous cost reduction recommendations.

509. At the 115th meeting of Samarco’s Board of Directors held on April 2, 2014, despite being aware of the risks involved in the operation of the tailings dams, Terra followed the Board’s recommendation to expand production and increase results for Samarco’s shareholders Vale and BHP, while the budget for the General Geotechnical Management was cut.

510. At the 119th meeting of Samarco’s Board of Directors held on December 10, 2014, Terra learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining Fundão’s stability. Among the actions Samarco failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Terra was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1’s left abutment and the failure to maintain minimum beaches with width between dam crest and water at a distance of 200 meters or more. Terra passively witnessed the Board’s decision to take note of the information and the agreement that, after safety, cost reduction should be the main focus of management in 2015.

511. At the 120th meeting of Samarco’s Board of Directors held on April 15, 2015, Terra learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Terra received documentary evidence showing the setback in Dike 1’s left abutment, which violated the Fundão project and Samarco’s manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board

of Directors. Terra also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam's stability.

512. At the 121st meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

513. Terra also participated in numerous meetings of Samarco's Dams Committee, where the problems, flaws and nonconformities of the Fundão dam were discussed, including at meetings held on February 28, 2012, September 25, 2012, December 14, 2012, June 11, 2013 and October 2, 2013. Terra took part in decisions related to the Fundão dam, including: depositing slimes mixed with sand in the Dike 1A reservoir; decision not to follow the ITRB's recommendation to hire Pimenta de Avila to supervise the work of the Geotechnical Management, whose team was considered inexperienced and lacking the expertise needed to handle the complexity of the Fundão dam; and continuing operations despite the many problems experienced at the Fundão dam.

514. Terra participated frequently in ITRB meetings, where the consultants reported problems, flaws, and nonconformities related to the Fundão dam.

515. Terra participated, on a monthly basis, in presentations made at Samarco's Executive Board's meetings regarding risks related to critical failures in the process of dam implementation and in the dam operation process, and had access to all the risks identified and all the action plans that were not properly or timely implemented.

516. As the Operations and Infrastructure Officer of Samarco, Terra was responsible for ensuring that the information contained in the Economic Mining Plans and in Samarco's Annual Mining Reports during the years of 2012, 2013, 2014 and 2015 was complete and accurate. Despite knowing that Vale was depositing tailing at the Fundão dam from Vale's mine Alegria, Terra failed to report that fact, which impeded the proper supervision of Samarco's mining activities by the relevant Brazilian authorities, including DNPM.

C. Defendant Maury de Souza Júnior

517. Defendant Souza has been Samarco's Chief Project Implementation and Ecoefficiency Officer since 2012. Souza participated in all discussions and deliberations of Samarco's Board of Directors occurring since April 4, 2012, from the 106th meeting to the 121st meeting. As Samarco's Chief Project Officer, Souza was responsible for submitting to the Board of Directors relevant projects including, for example, raising of Fundão dam to elevation 920m at the 120th Board of Directors meeting and to elevation 940m at the 121st Board of Directors meeting.

518. During his tenure as Operations Officer, member of the Samarco's Operations Committee and member of the Dam Committee, Souza had knowledge of the risks, failures and nonconformities at the Fundão dam.

519. Souza participated in all the meetings of the Operations Committee, where problems, flaws or nonconformities of the Fundão dam were discussed. These problems included: gallery problems; drainage problems; axis setback in the left abutment without a design and failure to follow the operations manual; failure to update the operations manual and the risk letter; minimum beach maintenance, with width less than 200 meters; problems associated with fixing the setback of the axis; and contamination of sandy tailing by slimes. These issues were

discussed at Operations Committee meetings held on the following dates: 11/21/2012, 03/15/2013, 13/11/2013, 03/14/2014, 11/19/2014, 03/18/2015 and 10/07/2015.

D. Defendant Sérgio Consoli Fernandes

520. Defendant Fernandes served as an alternate member of Samarco's Board of Directors from 2012 up to the dam's collapse. He was appointed in that position by BHP Brasil, where he has been BHP Billiton's Director of Iron Ore in the Americas since April, 2012. He participated in all the discussions and deliberations that occurred at the Board of Directors meetings held on December 4, 2013, April 2, 2014, September 19, 2014, December 10, 2014, April 15, 2015 and August 5, 2015.

521. During his tenure as an alternate board member, Fernandes had knowledge of the risks, failures and nonconformities at the Fundão dam.

522. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Fernandes received detailed information on the tailings disposal system and participated in discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Fernandes continued to implement cost containment policies at Samarco, directing the Directorate to pay "attention to production gains" and to Samarco's budget, making numerous cost reduction recommendations.

523. At the 115th meeting of Samarco's Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Fernandes continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco's General Geotechnical Management was cut.

524. At the 119th meeting of Samarco's Board of Directors held on December 10, 2014, Fernandes learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining Fundão's stability. Among the actions Samarco

failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Fernandes was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1's left abutment and the failure to maintain minimum beaches with width between dam crest and water at a distance of 200 meters or more. Fernandes took note of the information and the agreement that, after safety, cost reduction should be the main focus of management in 2015.

525. At the 120th meeting of Samarco's Board of Directors held on April 15, 2015, Fernandes learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Fernandes received documentary evidence showing the setback in Dike 1's left abutment, which violated the Fundão project and Samarco's manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board of Directors. Fernandes also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam's stability. Despite his knowledge that the Fundão dam was not safe, Fernandes approved an additional dividend distribution to BHP Brasil and Vale of approximately US\$ 650 million.

526. At the 121st meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

527. Fernandes also participated, as a guest of the Board and a BHP representative, at the 109th meeting of Samarco's Board of Directors held on December 7, 2012. At that time, he

received a detailed presentation of the dams made by Kleber Terra, who discussed the following topics: operations area, disposal system, dam management model, dam management governance, dam management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the company's agenda up to the year 2038.

528. Fernandes also appeared as BHP representative in the Operations Committee from 2012 to the moment of the dam's break, and was aware of all the problems, failures or non-conformities of the dam brought to the Committee's attention, having participated in all deliberations that took place at the meetings held on March 26, 2012, November 11, 2012, March 15, 2013, November 13, 2013, March 14, 2014, November 19, 2014, March 18, 2015, and July 10, 2015.

529. Fernandes was also a BHP representative in the Operational Performance Subcommittee from 2014 until the dam failed, and was aware of all problems, flaws or nonconformities brought to the Subcommittee, having participated in all deliberations at meetings held on June 13, 2014, August 7, 2014, October 21, 2014, February 10, 2015, December 5, 2015 and June 19, 2015.

530. Fernandes received reports from representatives of BHP who participated in the ITRB meetings, where the problems, flaws or nonconformities of the Fundão dam were discussed at length.

E. Defendant Jeffery Mark Zweig

531. Defendant Zweig served as an alternate member of Samarco's Board of Directors in 2012 and as a permanent member in 2013 and 2014. He has been Vice President of Strategy and Development of Iron Ore since February 1, 2012. Zweig participated in all the discussions and deliberations taking place at Samarco's Board of Directors meetings held on April 4, 2013, December 4, 2013 and April 2, 2014.

532. During his tenure as a member of the board of directors, Zweig had knowledge of the risks, failures and nonconformities at the Fundão dam.

533. At the 110th meeting of Samarco's Board of Directors held on April 4, 2013, Zweig received information regarding the disposal of Samarco's tailings in the Fundão dam, including its risks, and approved the initiatives presented, among which was continuing the axis setback in the left abutment.

534. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Zweig received detailed information on the tailings disposal system and participated in discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Zweig continued to implement cost containment policies at Samarco, directing the Directorate to pay attention to production gains and to Samarco's budget, making numerous cost reduction recommendations.

535. At the 115th meeting of Samarco's Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Zweig continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco's General Geotechnical Management was cut.

536. Zweig also participated as a guest and a BHP representative in Samarco's Board of Directors meetings held on August 8, 2012 and December 7, 2012, when he was Vice President of Strategy and Development of BHP. At the 108th meeting of Samarco's Board of Directors held on August 8, 2012, Zweig had access to a study on the community of Bento Rodrigues and on the risks the Fundão dam posed on that community.

537. At the 109th Samarco's Board of Directors meeting held on December 7, 2012, Zweig received a detailed presentation on tailings dams made by Defendant Terra, who

discussed the following topics: operations area, dams management model, dams management governance, dams management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the agenda up to the year 2038.

F. Defendant Margaret Beck

538. Defendant Beck served as an alternate member of Samarco's Board of Directors in 2014 and 2015. She has been BHP Billiton's Vice President of Finance, Iron Ore, since March, 2009. Beck participated in all the discussions and deliberations that took place at Samarco's Board of Directors meetings held on September 19, 2014, December 10, 2014, April 15, 2015 and August 5, 2015. As a BHP guest, she also attended the 115th Samarco's Board of Directors meeting held on April 2, 2014.

539. During her tenure as a member of the Board of Directors, Beck had knowledge of the risks, failures and nonconformities at the Fundão dam.

540. At the 119th meeting of Samarco's Board of Directors held on December 10, 2014, Beck learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining Fundão's stability. Among the actions Samarco failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Beck was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1's left abutment and the failure to maintain minimum beaches with a width between dam crest and water at a distance of 200 meters or more. Beck took note of the information and the agreement that, after safety, cost reduction should be the main focus of management in 2015.

541. At the 120th meeting of Samarco's Board of Directors held on April 15, 2015, Beck learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão

dam had been fixed. Beck received documentary evidence showing the setback in Dike 1's left abutment, which violated the Fundão project and Samarco's manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board of Directors. Beck also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam's stability. Despite knowing that the Fundão dam was not safe, Beck approved an additional dividend payment to BHP Brasil and Vale of approximately US \$650 million.

542. At the 121st meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

G. James John Wilson

543. Defendant Wilson served as a permanent member of Samarco's Board of Directors from 2012 to 2014. He was a member of the BHP Billiton Group Management Committee ("GMC"), reporting directly to Andrew Mackenzie, BHP Billiton's Chief Executive Officer. Wilson was appointed Chairman in 2014, and participated in all the discussions and deliberations that took place at Samarco's Board of Director meetings on December 4, 2013, April 2, 2014, September 19, 2014, December 10, 2014, April 15, 2015 and August 5 2015.

544. During his tenure as a member of the Board of Directors, Wilson had knowledge of the risks, failures and nonconformities at the Fundão dam.

545. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Wilson received detailed information on the tailings disposal system and participated in discussions where tailings continued to be deemed a matter of major concern. Despite those

concerns, Wilson continued to implement cost containment policies at Samarco, directing the Directorate to pay “attention to production gains” and to Samarco’s budget, making numerous cost reduction recommendations.

546. At the 115th meeting of Samarco’s Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Wilson continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco’s General Geotechnical Management was cut.

547. At the 119th meeting of Samarco’s Board of Directors held on December 10, 2014, Wilson learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining Fundão’s stability. Among the actions Samarco failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Wilson was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1’s left abutment and the failure to maintain minimum beaches with a width between dam crest and water at a distance of 200 meters or more. Wilson took note of the information and the agreement that, after safety, cost reduction should be the main focus of management in 2015.

548. At the 120 meeting of Samarco’s Board of Directors held on April 15, 2015, Wilson learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Wilson received documentary evidence showing the setback in Dike 1’s left abutment, which violated the Fundão project and Samarco’s manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board of Directors. Wilson also learned that it was necessary to fix the internal drainage

system in the region of the abutments in order to guarantee the dam's stability. Despite knowing that the Fundão dam was not safe, Wilson approved an additional dividend distribution to BHP and Vale of approximately US \$650 million.

549. At the 121 meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

550. Wilson also participated, as a guest of the Board and a representative of BHP, at Samarco's Board of Directors meetings held on August 8, 2012 and December 7, 2012, while still serving as Chairman of BHP Billiton Iron Ore. At the 108th meeting of Samarco's Board of Directors held on August 8, 2012, Wilson was presented with a study on the community of Bento Rodrigues and on the risks the Fundão dam posed on that community. Wilson recommended resettlement of the community farther from the tailings dams, but the move did not happen before the dam collapsed.

551. At the 109th Board of Directors meeting held on December 7, 2012, Wilson received a detailed presentation on tailings dams made by Defendant Terra, who discussed the following topics: operations area, dams management model, dams management governance, dams management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the agenda up to the year 2038.

H. Defendant José Carlos Martins

552. Defendant Martins served as a permanent Samarco Board member, appointed by Vale, from 2006 to 2013, and participated in all the discussions and deliberations that took place at Samarco's Board of Directors meetings held on October 20, 2006, March 15, 2006, October

19, 2007, March 12, 2008, December 2, 2009, May 12, 2010, September 26, 2010, August 10, 2011, August 8, 2012, December 7, 2012 and April 4, 2013.

553. During his tenure as a member of Samarco's Board of Directors, Martins had knowledge of the risks, failures and nonconformities at the Fundão dam.

554. At the 42nd Board of Directors meeting held on October 20, 2006, Martins approved the third pelletizing project (P3P), initiating the first expansion process, and the construction of the Fundão dam.

555. At the 80th meeting of Samarco's Board of Directors held on December 12, 2009, Martins received the final report on the piping problems occurring at Dike 1. Martins approved the alternative of installing a drainage blanket to replace the bottom drains that stopped working properly. Martins received additional information on the problem existing at the Fundão dam at the following Samarco Board of Directors meetings: 05/12/2010 (the 85th meeting of the BoD) and 09/26/2010 (the 89th meeting of the BoD).

556. At the 99th meeting of Samarco's Board of Directors held on August 10, 2011, in which Martins participated, it was emphasized that tailings management was a major concern that deserved Samarco's continued attention, including: full compliance with the recommendations made by ITBR; focus on the catastrophic risks identified by the risk assessment made by ITRB, taking the necessary measures to avoid their occurrence; and periodic reports to the Board of Directors on tailings management.

557. At the 108th meeting of Samarco's Board of Directors held on August 8, 2012, Martins received a study on the community Bento Rodrigues and on the risks the Fundão dam posed on that community. Martins recommended resettling the community farther from the tailings dam, but the move did not happen before the dam collapsed.

558. At the 109th Board of Directors meeting held on December 7, 2012, Martins received a detailed presentation on tailings dams made by Defendant Terra, who discussed the following topics: operations area, dams management model, dams management governance, dams management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the agenda up to the year 2038.

559. At the 110th meeting of Samarco's Board of Directors held on April 4, 2013, Martins received information regarding the disposal of Samarco's tailings in the Fundão dam, including its risks, and approved the initiatives presented, among which was continuing the axis setback in the left abutment.

I. Defendant Hélio Cabral Moreira

560. Defendant Moreira served as a permanent member of Samarco's Board of Directors in 2012, 2013 and early 2014, participating in all the discussions and deliberations that took place at the Board of Directors meetings held on April 4, 2013, December 4, 2013 and April 2, 2014.

561. During his tenure as a member and/or guest of the Board of Directors, Moreira had knowledge of the risks, failures and nonconformities at the Fundão dam.

562. At the 110th meeting of Samarco's Board of Directors held on April 4, 2013, Moreira received information regarding the disposal of Samarco's tailings in the Fundão dam, including its risks, and approved the initiatives presented, among which was continuing the axis setback in the left abutment.

563. At the 114th meeting of Samarco's Board of Directors held on December 4, 2013, Moreira received detailed information on the tailings disposal system and participated in discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Moreira continued to implement cost containment policies at Samarco, directing the

Directorate to pay “attention to production gains” and to Samarco’s budget, making numerous cost reduction recommendations.

564. At the 115th meeting of Samarco’s Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Moreira continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco’s General Geotechnical Management was cut.

565. Moreira also participated, as a guest representative of Vale, at the 108th Board of Directors meeting held on August 8, 2012, where he received a study on the community Bento Rodrigues and on the risks the Fundão dam posed on that community.

566. Invited as a guest of Vale, Moreira also attended the 109th Board of Directors held on December 7, 2012. In this meeting, Moreira received a detailed presentation on tailings dams made by Defendant Terra, who discussed the following topics: operations area, dams management model, dams management governance, dams management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the agenda up to the year 2038.

567. Moreira was a Vale representative in Samarco’s Operations Committee in 2013, where the problems, flaws or nonconformities related to the Fundão dam were discussed. Moreira participated in all the deliberations that took place at the meetings held on March 15, 2013 and November 13, 2013.

J. Defendant Pedro José Rodrigues

568. Defendant Rodrigues, an Officer of Merger and Acquisitions and Investment Participations at Vale, served as a member of Samarco’s Board of Directors from 2014 until the time the dam collapsed. Rodrigues participated in all the discussions and deliberations that took place at Samarco’s Board of Directors meetings held on September 19, 2014 and April 15, 2015.

569. At the 119th Board of Directors meeting, after a presentation made by Vescovi on the tailings disposal system, it was highlighted that Samarco should “focus on solving the limitations of the tailings disposal in the dams and dump sites.” Rodrigues participated in the meeting.

570. At the 120th meeting of Samarco’s Board of Directors held on April 15, 2015, Rodrigues learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Rodrigues received documentary evidence showing the setback in Dike 1’s left abutment, which violated the Fundão project and Samarco’s manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board of Directors. Rodrigues also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam’s stability. Despite knowing that the Fundão dam was not safe, Rodrigues approved an additional dividend distribution to BHP Brasil and Vale of approximately US \$650 million.

K. Stephen Michael Potter

571. Defendant Potter served as an alternate member of Samarco’s Board of Directors from 2012 to 2014 and became a permanent member in 2015. Potter was Director of Strategy of the Vale Global Strategic Planning Department since 2012. He participated in all the discussions and deliberations that occurred at Samarco’s Board of Directors meetings held on December 12, 2013, April 2, 2014, September 19, 2014, December 10, 2014, April 15, 2015 and August 5, 2015.

572. During his tenure as a member of the Board of Directors, Potter had knowledge of the risks, failures and nonconformities at the Fundão dam.

573. At the 114th meeting of Samarco’s Board of Directors held on December 4, 2013, Potter received detailed information on the tailings disposal system and participated in

discussions where tailings continued to be deemed a matter of major concern. Despite those concerns, Potter continued to implement cost containment policies at Samarco, directing the Samarco Directorate to pay “attention to production gains” and to Samarco’s budget, making numerous cost reduction recommendations.

574. At the 115th meeting of Samarco’s Board of Directors held on April 2, 2014, despite knowing the risks involved in the operation of tailings dams, Potter continued the reckless policy of expanding production and dividend distribution to BHP Brasil and Vale, while the budget for Samarco’s General Geotechnical Management was cut.

575. At the 119th meeting of Samarco’s Board of Directors held on December 10, 2014, Potter learned that Samarco failed to implement all the recommendations made by ITRB, which were essential for maintaining Fundão’s stability. Among the actions Samarco failed to implement were actions to be taken with respect to the axis setback in the left abutment and actions designed to strengthen the internal drainage system at the Fundão dam. Potter was presented with documentary evidence reflecting the problems, failures and nonconformities at the Fundão dam, including the existence of a setback in Dike 1’s left abutment and the failure to maintain minimum beaches with width between dam crest and water at a distance of 200 meters or more. Potter took note of the information and stated that, after safety, cost reduction should be the main focus of management in 2015.

576. At the 120th meeting of Samarco’s Board of Directors held on April 15, 2015, Potter learned that only 37% of the failures or nonconformities identified by ITRB in the Fundão dam had been fixed. Potter received documentary evidence showing the setback in Dike 1’s left abutment, which violated the Fundão project and Samarco’s manual of operations. The setback had already been raised by approximately 5 meters since the last presentation made to the Board

of Directors. Potter also learned that it was necessary to fix the internal drainage system in the region of the abutments in order to guarantee the dam's stability. Despite knowing that the Fundão dam was not safe, Potter approved an additional dividend distribution to BHP Brasil and Vale of approximately US \$650 million.

577. At the 121st meeting of Samarco's Board of Directors held on August 5, 2015, several cost reduction initiatives were presented, including the demobilization of 700 workers. Further cost implementations were discussed, including raising the Fundão dam to 920 meters. Documentary evidence presented at the meeting showed that the Fundão dam, with the Dike 1's axis setback, already reached 894 meters in elevation.

578. As a guest invited by Vale, Potter also received at the Samarco's 109th Board of Directors meeting held on December 7, 2012, a detailed presentation on tailings dams made by Defendant Terra, who discussed the following topics: operations area, dams management model, dams management governance, dams management and risk control, stability analysis of geotechnical structures, tailings disposal projects and the agenda up to the year 2038.

579. Potter was also a Vale representative on the Operations Committee from 2013 until the time the Fundão dam collapsed, and was aware of all the problems, flaws or nonconformities brought to the Committee, having participated in all deliberations that took place at the meetings held on March 15, 2013, November 13, 2013, March 14, 2014, November 19, 2014, March 18, 2015 and July 10, 2015.

L. Other Scierter Allegations

580. As alleged herein, Defendants acted with scierter in that they knew that the public documents and statements issued or disseminated in the name of Samarco, BHP and Vale were materially false and misleading; knew that such statements or documents would be issued or disseminated to the investing public; and knowingly and substantially participated or acquiesced

in the issuance or dissemination of such statements or documents as primary violations of the federal securities laws. As set forth elsewhere herein in detail, these Defendants, by virtue of their receipt of information reflecting the true facts regarding the companies, their control over, and/or receipt and/or modification of the companies' materially misleading statements and/or their associations with the companies, which made them privy to confidential proprietary information concerning the companies, participated in the fraudulent scheme alleged herein.

581. Defendants knew and/or recklessly disregarded the false and misleading nature of the information which they caused to be disseminated to the investing public. The fraudulent scheme described herein could not have been perpetrated during the Class Period without the knowledge and complicity or, at least, the reckless disregard of the personnel at the highest levels of the companies, including the Individual Defendants.

582. The Individual Defendants were high-level employees at the companies and/or members of Samarco's Board of Directors and, at a minimum, should have been aware of key facts related to the companies' operations, including its safety practices and related risks, and the Fundão dam collapse. The Individual Defendants were either members of the Board and/or the various Committees during the Class Period. These facts establish that the Individual Defendants were personally involved in, and knowledgeable about, the companies' safety practices and related risks, and the Fundão dam collapse.

583. The Individual Defendants were each members of senior management and/or the Board during the Class Period. Based on their roles, each of the Individual Defendants would have been involved with, or knowledgeable about, the wrongdoing alleged herein.

584. Additionally, the resignation and/or termination of Wilson—who was the President of Iron Ore, a member of the Samarco Board, and served on the Group Management

Committee —also contributes to an inference of scienter. Wilson’s departure in February 2016 came shortly after the end of the Class Period and the Fundão dam collapse. Likewise, BHP’s appointment of Della Valle to oversee BHP’s efforts in addressing the aftermath of the Fundão dam collapse in January 2016, in concert with Wilson’s departure from the company, demonstrates Defendants’ knowledge that the companies lacked adequate safety practices or, at a minimum, recklessness in not ensuring that adequate personnel were overseeing the companies’ safety practices during the Class Period.

585. Moreover, the homicide charges being pursued against the defendants, as well as the charges against them for endangering public health by polluting the region’s drinking water, support a finding of scienter.

586. Likewise, the conclusion by the state police in Minas Gerais that the Fundão dam was raised too quickly and that its collapse was caused by liquefaction supports a finding of scienter.

587. In addition, the federal Brazilian police’s investigation findings that, among other things, Samarco had ignored clear signs that the Fundão dam was at risk of failing for years, that Samarco skimmed on safety spending and focused instead on increasing production, that Samarco was “more than negligent” and that the collapse was not “an accident,” supports a finding of scienter.

588. The scope and breadth of the police report containing these findings—26 volumes comprising over 30,000 pages, including internal Samarco instant message communications—bolsters the credibility of these findings and, concomitantly, Defendants’ scienter.

589. At a minimum, Defendants failed to review or check information that they had a duty to monitor, or ignored obvious signs that their statements were materially false and

misleading or contained material omissions. Given the nature and extent of the problems concerning the Fundão dam, Defendants knew and/or recklessly disregarded the extent and scope of their statements during the Class Period.

590. Likewise, the Individual Defendants, by virtue of their high-level positions with the companies, directly participated in the management of the companies, were directly involved in the day-to-day operations of the companies at the highest levels, and were privy to confidential proprietary information concerning the companies and their business, operations, financial statements, and financial condition, as alleged herein. The Individual Defendants had the ultimate authority over and were involved in drafting, producing, reviewing and/or disseminating the false and misleading statements and information alleged herein, were aware, or recklessly disregarded that the false and misleading statements were being issued, and approved or ratified these statements, in violation of the law.

591. Moreover, Defendants failed to disclose the increased risk associated with, among other things, the P4P Project and the Fundão dam, which rendered the challenged statements materially false and misleading, thereby giving rise to an affirmative duty and/or obligation to disclose these known facts.

592. Likewise, the fraud alleged herein relates to the core business and operations of the companies, so knowledge of the fraud may be imputed to Defendants. Given Defendants' knowledge of the truth concerning the problems at the Fundão dam and the Fundão dam collapse, the positive statements detailed above, made contemporaneously with that knowledge, were false and/or misleading. Furthermore, these facts were known by high-level employees and/or Board members of Samarco, and their knowledge can be imputed to the companies.

593. The allegations above also establish a strong inference that Samarco, BHP and Vale acted with corporate scienter throughout the Class Period, as their officers, management, Board members and agents had actual knowledge of the misrepresentations and omissions of material facts set forth herein (for which they had a duty to disclose), or acted with reckless disregard for the truth because they failed to ascertain and to disclose such facts, even though such facts were available to them. Such material misrepresentations and/or omissions were done knowingly or with recklessness, and without a reasonable basis, for the purpose and effect of concealing the truth. By concealing material facts from investors, Defendants maintained and/or increased the artificially inflated price of Samarco's bonds throughout the Class Period.

IX. CLASS ACTION ALLEGATIONS

594. Plaintiffs bring this action as a class action pursuant to Federal Rule of Civil Procedure 23(a) and (b)(3) on behalf of a class consisting of all purchasers of debt securities issued by Samarco during the Class Period, who were damaged thereby (the "Class"). Excluded from the Class are Defendants and their families, as well as the officers and directors of the companies and the members of their immediate families and their legal representatives, heirs, successors or assigns and any entity in which Defendants have or had a controlling interest.

595. The members of the Class are so numerous that joinder is impracticable. While the exact number of Class members is unknown to Plaintiff at this time and can only be ascertained through discovery, Plaintiff believes there are hundreds, if not thousands, of members in the proposed Class. Record owners and other members of the Class may be identified from records maintained by Samarco or its transfer agent and may be notified of the pendency of this action by mail, using the form of notice similar to that customarily used in securities class actions.

596. Plaintiff's claims are typical of the claims of members of the Class because all Class members are and were similarly affected by Defendants' wrongful conduct in violation of the laws, as alleged herein.

597. Plaintiff will fairly and adequately protect the interests of the members of the Class and has retained counsel competent and experienced in class action and securities litigation.

598. Common questions of law and fact exist as to all Class members and predominate over any questions solely affecting individual members of the Class. Among the questions of law and fact common to the Class are:

- (a) whether the Exchange Act was violated by Defendants as alleged herein;
- (b) whether statements made by Defendants to the investing public during the Class Period misrepresented material facts about the business and operations of Samarco;
- (c) whether the trading price of Samarco's bonds was artificially inflated during the Class Period; and
- (d) to what extent the members of the Class have sustained damages and the proper measure of damages.

599. A class action is superior to all other available methods for the fair and efficient adjudication of this controversy since joinder of all members is impracticable. Furthermore, as the damages suffered by individual Class members may be relatively small, the expense and burden of individual litigation make it impossible for members of the Class to individually redress the wrongs done to them. There will be no difficulty in the management of this action as a class action.

X. APPLICABILITY OF PRESUMPTION OF RELIANCE: FRAUD-ON-THE-MARKET AND *AFFILIATED UTE* PRESUMPTIONS

600. Plaintiff will rely upon the presumption of reliance established by the fraud on the market doctrine as enunciated in *Basic Inc. v. Levinson*, 485 U.S. 224 (1988) (“*Basic*”) and the presumption of reliance for omissions as enunciated in *Affiliated Ute Citizens of Utah v. United States*, 406 U.S. 128 (1972) (“*Affiliated Ute*”).

601. With respect to the *Basic* presumption, a presumption of reliance under the fraud-on-the-market doctrine is appropriate because, among other things:

- (a) Defendants made public misrepresentations or failed to disclose material facts during the Class Period;
- (b) the omissions and misrepresentations were material;
- (c) the Samarco bonds traded in efficient markets;
- (d) the misrepresentations alleged would tend to induce a reasonable investor to misjudge the value of Samarco’s bonds; and
- (e) Plaintiff and other members of the Class purchased the Samarco bonds between the time Defendants misrepresented or failed to disclose material facts and the time the true facts were disclosed, without knowledge of the misrepresented or omitted facts.

602. At all relevant times, the market for Samarco’s bonds was efficient for the following reasons, among others:

- a) During the Class Period, Samarco was actively followed by a wide variety of news media. A minimum of 1,180 articles having “Samarco” in the title and first paragraph, were published in the Class Period.⁹

⁹ Dow Jones *Factiva*.

b) Major rating agencies analyzed Samarco's creditworthiness and published their ratings and rating rationales for Samarco bonds during the Class Period. The October 2012 Samarco bond issue was rated by Standard and Poor's ("S&P") from October 22, 2016, and by Fitch from October 30, 2012. The October 2013 bond issue was rated by S&P from October 21, 2013 and by Fitch from October 23, 2013. The September 2014 bond issue was rated by S&P from September 23, 2014, and by Fitch from September 29, 2014. Moody's rated all three bond issues from September 18, 2015.¹⁰

603. As a result of the foregoing, the market for Samarco's bonds promptly digested current information regarding the company from publicly available sources and reflected such information in the price of the bonds. Under these circumstances, all purchasers of the Samarco bonds during the Class Period suffered similar injury through their purchase of such bonds at artificially inflated prices, and a presumption of reliance applies.

604. In addition to the *Basic* presumption, a class-wide presumption of reliance is also appropriate in this action under the Supreme Court's holding in *Affiliated Ute*, because the claims alleged are grounded on Defendants' material omissions. Because this action involves Defendants' failure to disclose material adverse information regarding Samarco's mining operations, positive proof of reliance is not a prerequisite to recovery. Instead, all that is necessary to invoke the *Affiliated Ute* presumption of reliance is that the facts withheld would be material in the sense that a reasonable investor might have considered them important in making investment decisions. Given the importance of the Class Period's material misstatements and omissions set forth above, that requirement is satisfied here.

¹⁰ Bloomberg.

COUNT I

Violation of Section 10(b) of the Exchange Act and Rule 10b-5 Against All Defendants

605. Plaintiff repeats and realleges each allegation contained above as if set forth herein.

606. This count is brought on behalf of all purchasers of debt securities issued by Samarco, who purchased Samarco debt securities in domestic (U.S.) transactions during the Class Period.

607. During the Class Period, Defendants disseminated and approved false and misleading statements, which they knew or deliberately disregarded were false and misleading when made.

608. Defendants violated Section 10(b) of the Exchange Act and Rule 10b-5 in that they:

- (a) employed devices, schemes, and artifices to defraud;
- (b) made untrue statements of material facts or omitted to state material facts necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading; and/or
- (c) engaged in acts, practices, and a course of business that operated as a fraud or deceit upon Plaintiff and others similarly situated in connection with their purchases of Samarco bonds during the Class Period.

609. As alleged herein, Defendants acted with scienter in that they knew that the public documents and statements issued or disseminated were materially false and misleading; knew that such statements or documents would be issued or disseminated to the investing public; and knowingly and substantially participated or acquiesced in the issuance or dissemination of such statements or documents as primary violations of the federal securities laws.

610. Additionally, as set forth elsewhere herein, Defendants participated in the fraudulent scheme alleged herein by virtue of their receipt of information reflecting the true facts regarding Samarco, BHP, and Vale, their control over, and/or receipt and/or modification of Samarco, BHP, and Vale's allegedly materially misleading misstatements and/or their associations with the companies, which made them privy to confidential proprietary information concerning the Fundão dam and Samarco's mining operations.

611. Plaintiff and the Class have suffered damages in that, in reliance on the integrity of the market, they paid artificially inflated prices for the Samarco bonds. Plaintiff and the Class would not have purchased the Samarco bonds at the prices they paid, or at all, had they been aware that the market prices had been artificially and falsely inflated by Defendants' misleading statements.

612. As a direct and proximate result of these Defendants' wrongful conduct, Plaintiff and the other members of the Class suffered damages in connection with their purchases of the Samarco bonds during the Class Period.

COUNT II

Violation of Section 20(a) of the Exchange Act Against Defendants BHP Billiton Ltd., BHP Billiton Plc, BHP Billiton Brasil Ltda. and Vale, and Against the Individual Defendants

613. Plaintiff repeats and realleges each allegation above as if set forth herein.

614. This count is brought on behalf of all purchasers of debt securities issued by Samarco, who purchased Samarco debt securities in domestic (U.S.) transactions during the Class Period.

615. Defendants BHP Billiton Ltd., BHP Billiton Plc, BHP Billiton Brasil Ltda. and Vale acted as controlling persons of Samarco within the meaning of Section 20(a) of the

Exchange Act. As described above, these defendants had the power and authority to cause Samarco to engage in the wrongful conduct complained of herein.

616. Each of the Individual Defendants, by virtue of their control, ownership, directorship, and specific acts was, at the time of the wrongs alleged herein and as set forth herein, a control person of Samarco within the meaning of Section 20(a) of the Exchange Act.

617. By reason of such conduct, Defendants BHP Billiton Ltd., BHP Billiton Plc, BHP Billiton Brasil Ltda. and Vale, and the Individual Defendants, are liable pursuant to Section 20(a) of the Exchange Act.

618. As a direct and proximate result of Defendants' wrongful conduct, Plaintiff and the other members of the Class suffered damages in connection with their purchases of Samarco bonds during the Class Period.

COUNT III

Common Law Fraud Against All Defendants

619. Plaintiff repeats and realleges each allegation above as if set forth herein.

620. This count is brought on behalf of all purchasers of debt securities issued by Samarco during the Class Period.

621. As alleged herein, Defendants made material misrepresentations and omitted to disclose material facts about the companies' commitment to health and safety; the adequacy of safety, risk management and monitoring protocols; compliance with local laws and regulations; the P4P project, PP&E, production capacity and projected performance; cost and capital expenditure reductions; tailings and waste disposal; and toxicity of tailings-based mudflows.

622. The aforesaid misrepresentations and omissions by Defendants were made intentionally, or at a minimum with severe recklessness, to induce reliance thereon by Plaintiff and the Class when making their investment decisions.

623. The aforesaid misrepresentations and omissions by Defendants constitute fraud under New York law.

624. Plaintiff and the Class reasonably relied on Defendants' misrepresentations when deciding to purchase the Samarco bonds and when otherwise making investment decisions with regard to those securities during the Class Period, and did not know of any of the misrepresentations and omissions at the time the investment decisions were made. Plaintiffs' and the Class members' reliance was justified since they were unaware of the true facts; if the true facts had been known to Plaintiff and the other members of the Class, they would not have acted as they did in holding and purchasing the Samarco bonds.

625. As a direct and proximate cause of the fraud and deceit by Defendants, Plaintiff and the Class suffered damages in connection with their investments in the Samarco bonds during the Class Period.

626. The fraud committed by Defendants was intentional and/or involved conscious acts that willfully and wantonly disregarded the rights of others, including Plaintiff and the Class. As a result, Defendants are liable to Plaintiff and the Class for damages.

COUNT IV

Aiding and Abetting Fraud Against All Defendants

627. Plaintiff repeats and realleges each allegation above as if set forth herein.

628. This count is brought on behalf of all purchasers of debt securities issued by Samarco during the Class Period.

629. This claim is asserted against each Defendant for aiding and abetting common law fraud. Each Defendant was aware of the fraudulent scheme that is the subject of this complaint.

630. Each Defendant provided substantial assistance to the perpetrators of the fraud, in furtherance of the fraud.

631. Each Defendant made material false statements to Plaintiff and the Class and failed to correct statements made by the other Defendants that such Defendant knew to be materially false and misleading.

632. Plaintiff and the Class reasonably relied on Defendants' false statements and suffered substantial damages as a result.

633. Each Defendant is jointly and severally liable to the Class for aiding and abetting common law fraud.

COUNT V

Negligent Misrepresentation Against All Defendants

634. Plaintiff repeats and realleges each allegation above as if set forth herein.

635. This count is brought on behalf of all purchasers of debt securities issued by Samarco during the Class Period.

636. Defendants had a special or privity-like relationship of trust or confidence with Plaintiff and the Class of Samarco bondholders, which created a duty on the part of Defendants to impart full and correct information to Plaintiff and the Class.

637. Defendants made false and misleading representations to Plaintiff and the Class knowing that Plaintiff and the Class would rely upon the representations and omissions for the particular purpose of determining whether to purchase or sale Samarco bonds.

638. Plaintiff and the Class justifiably relied upon the false representations made by the Defendants in furtherance of that particular purpose by purchasing or selling Samarco bonds.

639. As a result of their reliance upon the false representations made by Defendants, Plaintiff and the Class have suffered damages. Defendants' wrongful conduct was the direct and proximate cause of Plaintiff's and the Class's losses.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff, on behalf of itself and the Class, prays for judgment:

- A. Determining that this action is a proper class action, certifying Plaintiff as Class Representative under Fed. R. Civ. P. 23, and appointing Lead Counsel as Class counsel;
- B. Awarding compensatory and any other applicable damages in favor of Plaintiff and the other Class members against all Defendants, jointly and severally, for all damages sustained as a result of Defendants' wrongdoing, in an amount to be proven at trial, including interest thereon;
- C. Awarding Plaintiff and the Class their reasonable costs and expenses incurred in this action, including counsel fees and expert fees; and
- D. Awarding Plaintiff and other members of the Class such other and further relief as the Court deems just and proper under the circumstances.

JURY TRIAL DEMAND

Dated: March 6, 2017
New York, New York

POMERANTZ LLP

/s/ Jeremy A. Lieberman

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